PREFERRED ARGUMENT STRUCTURE IN MANDARIN CHILD LANGUAGE

Chiung-chih Huang
National Chengchi University

ABSTRACT

This study investigated whether Preferred Argument Structure (Du Bois, 1987) is characteristic of early child Mandarin (2;2-3;1), and whether the patterns observed in child Mandarin can be explained by the account of human-ness suggested by Everett (2009). The results showed that Mandarin child language conforms to the constraints of Preferred Argument Structure, but that it does not support the related hypothesis of an ergative structuring of discourse. Both the factor of human-ness (Everett, 2009) and that of role types contribute to the accusative patterning observed in the data. The results are discussed in relation to children's sensitivity to the association between discourse and grammar, and to the referential strategies used by adults in conversations with young children.

Key words: Preferred Argument Structure, child language, Mandarin

1. INTRODUCTION

Research on adult grammar includes a long and flourishing tradition of theoretical approaches that consider discourse pragmatics as crucial for understanding grammar (Ariel, 1990, 1996; Chafe, 1976, 1994, 1996; Du Bois, 1987; Givón, 1984; Halliday & Hasanm 1976; Huang, 2000; Levison, 1987, 1991). In language acquisition research, however, grammar and discourse are frequently treated as separate domains that do not interact in any significant way. Recently, several studies have been conducted to investigate the adaptability of this use-oriented approach to children's referential choice. It has been shown that children, like adults,

are sensitive to the dynamics of information flow in discourse, and that their referential choice reflects this sensitivity (Allen, 2000; Guerriero et al., 2006; Huang, 2011; Paradis & Navarro, 2003; Serratrice, 2005). Following this line of research, the present study attempts to further investigate referential choice in child language by testing the hypothesis known as Preferred Argument Structure (Du Bois, 1987), which has been extensively tested for adult speech cross-linguistically.

1.1 Preferred Argument Structure: The Discourse and Grammar Interface

In his seminal article, Du Bois (1987) formulates 'Preferred Argument Structure' to illuminate the relationship between discourse patterns and grammatical forms. As pointed out by Du Bois, 'Preferred Argument Structure represents neither a discourse structure nor a syntactic structure per se, but a preference in discourse for a particular syntactic configuration of linguistic elements, both grammatical and pragmatic' (Du Bois, 2003b:48).

Preferred Augment Structure concerns information flow in discourse and its interaction with the primary noun arguments associated with verb phrases: The subject of a transitive verb (A), the object of a transitive verb (O), and the subject of an intransitive verb (S). In examining Sakapulteko discourse, Du Bois found evidence of an ergative patterning in the appearance of lexical arguments: Full lexical noun phrases rarely occur in the A role, but overwhelmingly occur in the S role or the O role. In a pragmatic parallel to this, new information freely appears in the S role or the O role, but not in the A role.

The central notions of Preferred Argument Structure can be expressed in the form of four constraints, as shown in Table 1. As seen in Table 1, Preferred Argument Structure has two parallel dimensions: a grammatical dimension and a pragmatic dimension. Each dimension can be expressed by two constraints: a quantity constraint and a role constraint.

Table 1. Dimensions and constraints of Preferred Argument Structure

	Grammar	Pragmatics
Quantity	One Lexical Argument Constraint: Avoid more than one lexical argument per clause	One New Argument Constraint: Avoid more than one new argument per clause
Role	Non-lexical A Constraint: Avoid lexical A's	Given A Constraint: Avoid new A's

(Source: Adapted from Du Bois, 1987:.829)

Preferred Argument Structure claims that each clause contains no more than one lexical argument (the 'One Lexical Argument Constraint'); that the lexical argument does not appear in the A role (the 'Non-lexical A Constraint'); that each clause contains no more than one argument carrying new information (the 'One New Argument Constraint'); that new information is introduced into discourse through the non-A role, i.e., O or S, and that the A role typically carries old information (the 'Given A Constraint'). These constraints show the correlation between grammatical roles, pragmatic information and morphological forms of arguments. They also suggest a universal ergative pattern of referent distribution: S is aligned with O, as opposed to A.

Although Du Bois first derived Preferred Argument Structure from narratives in Sakapultek Maya, an ergative language (Du Bois 1985, 1987), subsequent research has shown that it is a cross-linguistic phenomenon. The patterns of Preferred Argument Structure have been documented in a wide array of languages, both of the ergative-absolutive and of the nominative-accusative types. These include languages such as Korean, Nepali, Inuktitut, Finnish, Mapudungun, and Roviana (Clancy, 1993, 2003; Genetti & Crain, 2003; Allen & Schroder, 2003; Helasvuo, 2003; Arnold, 2003; Corston-Oliver, 2003). Preferred Argument Structure has thus been extensively tested across languages.

Although the constraints of Preferred Argument Structure have been supported across languages, the related hypothesis of an ergative basis of discourse has been questioned by a number of researchers (O'Dowd, 1990; Chui, 1992; Karkkainen, 1996; Kumagai, 2006; Lin, 2009).

O'Dowd (1990) investigated information distributions in English. Her data consisted of orally-delivered paramedical training sessions. The ergative patterning of discourse was not borne out by her English data. Instead, her data exhibited an accusative pattern in terms of referent distribution; that is, the S role and the A role were found to contain consistently lower percentages of new information than the O role. Thus, the S role aligns itself more closely with the A role than it does with the O role. O'Dowd suggested that Preferred Argument Structure may be sensitive to discourse genre, and that the S role is responsive to 'whatever discourse pressure prevails in a particular genre' (O'Dowd 1990:391).

Further studies have shown that the accusative alignment can also be observed in other types of English data. Karkkainen (1996) studied American English conversational discourse. The constraints of Preferred Argument Structure were shown to hold for her data. However, her data did not support the hypothesis of an ergative structuring of discourse; rather, the discourse structure observed in her English data showed a strong alignment of S with A than with O. In other words, the constraints on A can be seen to hold for S as well.

Kumagai (2006) analyzed English narrative data of the Pear Story, the same type of data used by Du Bois (1987), in order to obtain results which can be directly comparable to the findings of Du Bois (1987). The constraints of Preferred Argument Structure were also found to hold for the English narrative data; however, the data exhibited an accusative pattern of referent distribution. The study revealed that the information patterning in English discourse, even under high information pressure, is consistent with its morphologically accusative case marking.

As seen above, the results in these studies cast doubt on an ergative alignment of new/lexical mentions. In addition, Haspelmath's (2006) re-analysis of several of the studies reported in Du Bois, Kumpf, and Ashby (2003) found that these studies yield a rather different picture from that of Du Bois's original study of Sakapulteck. As pointed out by Haspelmath, the only consistent picture that emerges from these studies is that S behaves as intermediate between A and O. In other words, these studies may not constitute strong evidence for the hypothesis of an ergative pattern of referent distribution.

1.2 Preferred Argument Structure in Mandarin Chinese

Preferred Argument Structure has also been documented for Mandarin Chinese, a language which does not have inflection or case markers, and which is characterized by the phenomenon that both subjects and objects can be grammatically null. It has been reported in several studies that Mandarin exhibits an accusative alignment of argument roles (Chui, 1992; Huang & Chui, 2005; Lin, 2009).

Chui (1992) investigated eight oral narratives told by eight Mandarin native speakers of 20-25 years of age. It was found that Mandarin narrative discourse also displays Preferred Argument Structure. Mandarin exhibits the One Lexical Argument Constraint and the One New Argument Constraint. However, instead of avoiding lexical A's and new A's, Mandarin speakers disfavor both the A role and the S role, and strongly prefer the O role, for new mentions and lexical arguments. In other words, Mandarin exhibits an A/S alignment.

Huang and Chui (2005), in examining the pragmatics of word order in Mandarin, also showed that Mandarin is a discourse accusative language. It was found that S aligns with A in that they both tend to contain given information while the O role tends to introduce new information. In addition, the analysis of topic continuity also showed that S/A links far outnumber S/O links.

The accusative patterning of Mandarin has also been reported in Lin (2009). Lin (2009) investigated Preferred Argument Structure of different Mandarin text types, including conversations, narratives and written texts. The results showed that relatively less given information is found in conversations than in narratives and written texts. However, all of the three text types display a consistent tendency in that new information prefers the O role and given information favors the A role and the S role.

Tao and Thompson (1994) also provided relevant findings. In examining Mandarin conversation, Tao and Thompson showed that most of the verbs in their data are low on the transitivity scale, and that it is rare for clauses to have two overt arguments. In the case of one overt argument, full nouns are more likely to be found in the O role in high

transitivity clauses, but pronouns are the preferred form in the A role in low transitive clauses.

1.3 Preferred Argument Structure in Acquisition

Only a few studies have investigated child language in relation to Preferred Argument Structure. Evidence that child language also exhibits Preferred Argument Structure has been documented for Korean (Clancy 1993, 1997, 2003), Venezuelan Spanish (Bentivoglio, 1996), and Inuktitute (Allen & Schröder, 2003).

Clancy (2003) conducted a study investigating two Korean-speaking children's interaction with their caregivers. The children were recorded for one year since they were at the ages of 1;8 and 1;10, respectively. The results showed that the two Korean children exhibited Preferred Argument Structure. They abided by both the One Lexical Argument Constraint and the One New Argument Constraint. Only 4.7% and 5.4% of the two children's transitive verbs had two lexical arguments, and only 1.3% and 2.2% of the two children's transitive verbs had two new arguments. In addition, the constraints on lexical mention and new information in the A role were also strongly substantiated. A qualitative analysis was also conducted to examine the use of eight frequent verbs in the interaction, including *ita* 'be, *issta* 'exist', *ota* 'come', *kata* 'go', *hata* 'do', *pota* 'see', *cwuta* 'give, and *mekta* 'eat'. It was suggested by the qualitative analysis that two functional bases contributed to the observed distribution of new information: attention management and the participant structure of caregiver-child interaction.

Allen and Schröder (2003) examined the spontaneous speech of four Inuit children. The children were recorded for nine months since they were at the ages of 2;0, 2;6, 2;6 and 2;10, respectively. The One Lexical Argument Constraint and the One New Argument Constraint were fully supported by the Inuktitut child data. Only 0.04% of all clauses had two lexical arguments, and only 0.04% of all clauses had two new arguments. It was also evident that both lexical and new referring expressions tended to avoid appearing in the A role. Although the four constraints of Preferred Argument Structure were overall shown to hold for Inuktitut child language, two differences were observed between the Inuktitut data

and the data from other languages: Child Inuktitut evidenced a relatively lower percentage of lexical arguments and transitive clauses.

As seen above, only a few acquisition studies have been done in relation to Preferred Argument Structure. The constraints of Preferred Argument Structure and the ergative alignment of argument roles were shown to hold for these child language data.

1.4 The Motivations for Preferred Argument Structure

To explain the cross-linguistic evidence for Preferred Argument Structure, Du Bois (1987, 2003a) proposed that Preferred Argument Structure is motivated by specific cognitive motivations. Consider the following suggestion by Du Bois:

> I propose that the absolute syntactic position constitutes a sort of grammatically defined 'staging area' –- reserved for accommodating the process, apparently relatively demanding, of activating a previously inactive entity concept. (1987:834)

That is, the S and O positions constitute a 'staging area' for the conceptually onerous nature of the introduction of new referents. In other words, the S and O roles serve as predictable loci for 'unpredictable work', namely the introduction of new referents. Thus, the motivations Du Bois suggested concern the ease of cognitive processing.

Everett (2009), however, suggested that quality data supporting the aforementioned cognitive motivations are generally absent in the literature. As indicated by Everett, many researchers make the implicit assumption that in so far as their data support Preferred Argument Structure, such data will also support the putative motivations suggested by Du Bois. In addition, these studies may ignore confounding variables, lending support for the independent cognitively-motivated constraints. Everett proposed instead that Preferred Argument Structure is motivated by well-established semantic and pragmatic correlates of the S, A, and O roles; i.e., the correlation between human referents and given/non-lexical arguments, and the correlation between human referents and particular

roles. Such correlations have of course been noted in previous studies (e.g., Dryer, 1986; Hopper & Thompson, 1980); Du Bois also noted that the association of human-ness with the A role is categorical in Sacapultec. However, Everett pointed out that the significance of such correlations, vis-à-vis the motivations of Preferred Argument Structure, are not fully explored in the literature on Preferred Argument Structure.

In examining English and Portuguese conversation data, Everett (2009) showed that the rate of new/lexical mentions is greatest in the O role, followed by the S role; the rate of new/lexical mentions is lowest in the A role. This hierarchy, as suggested by Everett, is inconsistent with the cognitively-oriented motivations associated with the facilitation of the introduction of new referents. Instead, this pattern is due to more basic semantic and pragmatic factors associated with the human/non-human tendencies of particular argument types. As shown in the results, the O role tends to host non-human referents, while the S role hosts non-human referents at a lower rate than the O role, but at a higher rate than the A role. In addition, the vast majority of all lexical arguments have non-human referents, regardless of the grammatical role of the argument.

In short, Everett (2009) proposed an alternative motivation for Preferred Argument Structure. It is argued that the cognitive motivation for Preferred Argument Structure suggested in the literature is not the most parsimonious account. Instead, Preferred Argument Structure may result from more basic semantic and pragmatic factors in relation to the feature of human-ness.

1.5 The Present Study

The purpose of the present study is twofold. First, this study aims to examine whether Preferred Argument Structure is characteristic of early child Mandarin. It has been reported that Mandarin-speaking two-year-olds are sensitive to information status in deciding their referential choice in communicative interaction (Huang, 2011). By examining Mandarin-speaking children's speech in terms of Preferred Argument Structure, the present study attempts to further illuminate whether grammatical roles are correlated with the distribution of

referents both in relation to their discourse properties and in relation to the morphological forms in which they are represented. In addition, as reported in previous studies, Mandarin adult speech demonstrates an accusative structuring of discourse, rather than an ergative patterning (Chui, 1992; Huang & Chui, 2005; Lin, 2009). This study thus attempts to investigate whether early child Mandarin also exhibits an A/S alignment, reflecting the pattern observed in Mandarin adult speech. Furthermore, as reviewed above, research on Preferred Argument Structure has focused mainly on adult speech, and only a limited number of studies have examined child language specifically in relation to Preferred Argument Structure. This study thus also attempts to supplement this area of research.

The second purpose of this study is to test the claim put forward by Everett (2009); i.e., the claim that the patterns of Preferred Argument Structure can be accounted for in relation to the human/non-human tendencies of particular argument types. In other words, Everett suggests that it is the human-ness of an argument's referent, rather than the role in which that argument occurs, that is associated with the new/non-new or the lexical/non-lexical status of that argument. Everett's analysis of English and Portuguese conversation data has provided evidence supporting this account. However, a finer-grained analysis than the one presented by Everett is needed in order to have a more complete picture of the ramifications of this human-ness factor. This study thus also aims to provide a detailed analysis in order to understand the extent to which this human-ness factor can account for our Mandarin child data.

2. METHODS

2.1 Participants and Data

The participants in this study were two Mandarin-speaking girls, Lin and Jie (pseudonyms), and their mothers, who lived in the northern part of Taiwan. Lin had a younger sister and Jie was the only child. The parents of both children had received post-graduate education. The data used in this study consisted of eight hours of natural mother-child

conversation video-recorded at the children's homes, with four one-hour sessions with each child. Lin's data were recorded at the ages of 2;2, 2;6, 2:10 and 3;1, and Jie's data were recorded at the ages of 2;2, 2;7, 2;10 and 3;1. The children in this study were in general comparable to those in previous studies on referential strategies with regard to age (e.g., Allen, 2000; Allen & Schröder, 2003; Clancy, 1997; Guerriero et al., 2006; Huang, 2011). All of the data were collected in the living rooms of the children's homes. The two children's data sessions included similar activities, such as eating, reading books, drawing pictures, and playing with toys. The data collected were transcribed following the CHAT conventions and were analyzed using the CLAN program (MacWhinney, 2000).

The MLUs (i.e., mean length of utterance, defined in terms of the average length of utterances calculated in morphemes) of the children's data were 3.04 for Lin, and 2.58 for Jie. It was evident from the data that both of the children were able to produce transitive and intransitive clauses, and that different types of referential forms were used by the children for argument representation. In addition, the children referred frequently to both human referents (e.g., the self, the mother, the sister) and non-human referents (e.g., candies, shoes, flowers).

2.2 Coding Scheme

Each clause having an overt verb in the data was analyzed in terms of clause types. The core arguments of each of these verbs were further coded for grammatical roles, referential forms, informative status, and human-ness. The coding scheme of this study is as follows:

1. Clause types
    (a) Transitive clauses: Clauses which have verbs that take at least two arguments (e.g., *wo zai hua meiguihua* 'I am drawing a rose.')
    (b) Intransitive clauses: Clauses which have verbs that take only one argument (e.g., *meimei zai ku* 'Sister is crying.')

2. Grammatical roles
   (a) The A role: The subject of a grammatically transitive clause (e.g., the pronoun *wo* 'I' in *wo zai hua meiguihua* 'I am drawing a rose.')
   (b) The O role: The object of a grammatically transitive clause (e.g., the noun *meiguihua* 'rose' in *wo zai hua meiguihua* 'I am drawing a rose.')
   (c) The S role: The single argument of a grammatically intransitive clause (e.g., the noun *meime*i 'Sister' in *meimei zai ku* 'Sister is crying.')
3. Referential forms
   (a) Lexical forms: Including bare nouns (e.g., *mao* 'cat'), noun phrases (e.g., *hongse de hua* 'red flowers') and proper names (e.g., *Yiming Shushu* 'Uncle Yiming')
   (b) Non-lexical forms: Including null forms and pronominal forms (e.g., the pronoun *wo* 'I', the demonstrative *zhe* 'this')
4. Information status
   (a) New: A new mention denotes a referent that has not been previously talked about in the conversation at hand (Chafe, 1976, 1987; Du Bois, 1987).
   (b) Non-new: A non-new mention denotes a referent that has been previously talked about in the conversation at hand (Chafe, 1976, 1987; Du Bois, 1987).
5. Human-ness
   (a) Human: A mention which refers to a human referent
   (b) Non-human: A mention which refers to a non-human referent

3. RESULTS

3.1 Preferred Argument Structure

This section presents the analysis of the children's speech in terms of the four constraints of Preferred Argument Structure proposed by Du Bois (1987). We attempt to examine whether Preferred Argument

Structure is characteristic of early child Mandarin, and whether early child Mandarin exhibits an accusative pattern of referent distribution, reflecting the pattern observed in Mandarin adult speech.

3.1.1 One Lexical Argument Constraint

The One Lexical Argument Constraint claims that each clause contains no more than one lexical argument. Table 2 presents the frequency of the occurrence of clauses with zero, one and two lexical arguments in the data. As seen in the table, only 2.15% of the clauses in Lin's speech and 1.32% of those in Jie's speech contained two lexical arguments. The majority of the clauses in the children's speech contained no lexical arguments at all (62.82% and 73.06%).

Table 2. Frequency of clauses with zero, one, and two lexical arguments

Lexical Argument	Lin		Jie	
	N	%	N	%
0	615	62.82	1052	73.06
1	343	35.04	369	25.63
2	21	2.15	19	1.32
Total	979	100	1440	100

Since only transitive clauses can have more than one core argument, further analysis was conducted to analyze the clauses in the data in terms of transitivity. The results are shown in Table 3. As seen in the table, only 3.69% of transitive clauses in Lin's speech and only 2.61% of transitive clauses in Jie's speech had two lexical arguments. Most of the transitive clauses in the children's speech had either one or zero lexical argument. As for intransitive clauses, while a few of the intransitive clauses had one lexical argument, the vast majority of such clauses had zero lexical argument (84.15% and 87.24%). The results thus supported the One Lexical Argument Constraint.

Table 3. Transitivity and frequency of lexical arguments in clause

Lexical	Lin				Jie			
	Transitive		Intransitive		Transitive		Intransitive	
	N	%	N	%	N	%	N	%
0	270	47.45	345	84.15	430	59.15	622	87.24
1	278	48.86	65	15.85	278	38.24	91	12.76
2	21	3.69	0	0	19	2.61	0	0
Total	569	100	410	100	727	100	713	100

3.1.2 One New Argument Constraint

The One New Argument Constraint indicates that each clause contains no more than one argument carrying new information. Table 4 displays the frequency of the occurrence of clauses with zero, one and two new arguments in the data. As seen in the table, only 1.12% of the clauses in Lin's speech and 0.35% of those in Jie's speech contained two new arguments. The majority of the clauses in the children's speech contained no new argument (76.61% and 85.56%).

Table 4. Frequency of clauses with zero, one, and two new arguments

New Argument	Lin		Jie	
	N	%	N	%
0	750	76.61	1232	85.56
1	218	22.27	203	14.1
2	11	1.12	5	0.35
Total	979	100	1440	100

Further analysis was conducted to analyze the clauses in the data in terms of transitivity. As seen in Table 5, only 1.93% of the transitive clauses in Lin's speech and only 0.69% of those in Jie's speech had two new arguments. Most of the transitive clauses in the children's speech had either one or zero new argument, and the percentage of clauses with zero new argument was much higher than that of clauses with one new argument. As for intransitive clauses, only a few intransitive clauses had one new argument; the overwhelming majority of the intransitive clauses

had zero new argument (88.78% and 91.16%). The results thus confirmed the One New Argument Constraint.

Table 5. Transitivity and frequency of new arguments in clause

New	Lin				Jie			
	Transitive		Intransitive		Transitive		Intransitive	
	N	%	N	%	N	%	N	%
0	386	67.84	364	88.78	582	80.06	650	91.16
1	172	30.23	46	11.22	140	19.26	63	8.84
2	11	1.93	0	0	5	0.69	0	0
Total	569	100	410	100	727	100	713	100

In short, the two quantity constraints were supported by the results of the present study. It was notably rare that the children produced clauses with more than one lexical argument or with more than one new argument.

Examples 1 and 2 present the children's utterances in which the One Lexical Argument Constraint and the One New Argument Constraint are evident. Example 1 demonstrates a case in which a clause contains only one lexical argument; Example 2 is an illustration of a clause containing zero lexical argument. In addition, these two examples also demonstrate the instances in which the clauses contain one new argument and zero new argument, respectively.

(1) Lin: # 15, 2;10
(LIN is asking for candies.)

*LIN:	要	吃	草莓	糖 -: .	←
	yao	chi	caomei	tang -:	
	want	eat	strawberry	candy	

'(I) want to eat strawberry candies.'

*MOT:	要 #	叔叔	要	結束	了 #
	yao #	shushu	yao	jieshu	le #
	have to	uncle	have to	end	PRF
	才	可以	吃.		
	cai	keyi	chi		
	then	can	eat		

'(You) can eat them after Uncle (=the observer) finishes the recording.'

(2) Jie, #24, 2;7
(MOT is eating instant noodles.)

*MOT:	你	看	好	辣	喔.
	ni	kan	hao	la	o
	2SG	look	very	spicy	PRT

'Look. They're very spicy.'

*JIE:	我	也	要.	←
	wo	ye	yao	
	1SG	also	want	

'I also want to eat (them).'

*MOT:	你	要	吃	喔.
	ni	yao	chi	o
	2SG	want	eat	PRT

'You also want to eat (them).'

3.1.3 Non-lexical A Constraint

The Non-lexical A Constraint states that lexical forms avoid appearing in the A position. Table 6 presents the distributions of lexical mentions across the grammatical roles in the children's data. As seen in the table, lexical mentions appeared mostly in the O role (69.35% and 67.57%), and only small proportions of lexical mentions occurred in the A role (13.77% and 10.07%) or in the S role (16.88% and 22.36%). It appears that the children avoided not only lexical A's but also lexical S's.

Table 6. Lexical mentions across grammatical roles

	A		S		O		Total	
	N	%	N	%	N	%	N	%
Lin	53	13.77	65	16.88	267	69.35	385	100
Jie	41	10.07	91	22.36	275	67.57	407	100

The referential forms used by the children were further analyzed to demonstrate their distribution within each grammatical role. The results are presented in Figure 1. Figure 1 shows that non-lexical forms were used more frequently than lexical forms in all of the grammatical roles in the children's data; however, noticeable differences were observed in the distributions. As seen in the figure, the majority of the A arguments and the S arguments were non-lexical: 90.69% of the A's and 84.15% of the S's were non-lexical in Lin's data, and 94.36% of the A's and 87.24% of the S's were non-lexical in Jie's data. In the case of the O arguments, however, the proportions of lexical and non-lexical forms differed less dramatically: 46.92% vs. 53.08% in Lin's data and 37.83% vs. 62.17% in Jie's data. The results thus revealed that arguments in the A and S roles were much more likely to be non-lexical than those in the O role. Chi-square analyses were further conducted to examine the distributions of the referential forms in the A, S, and O roles. The results showed that the distributions were significantly different in both Lin's data and Jie's

data, suggesting that the children's use of referential forms was influenced by grammatical roles.
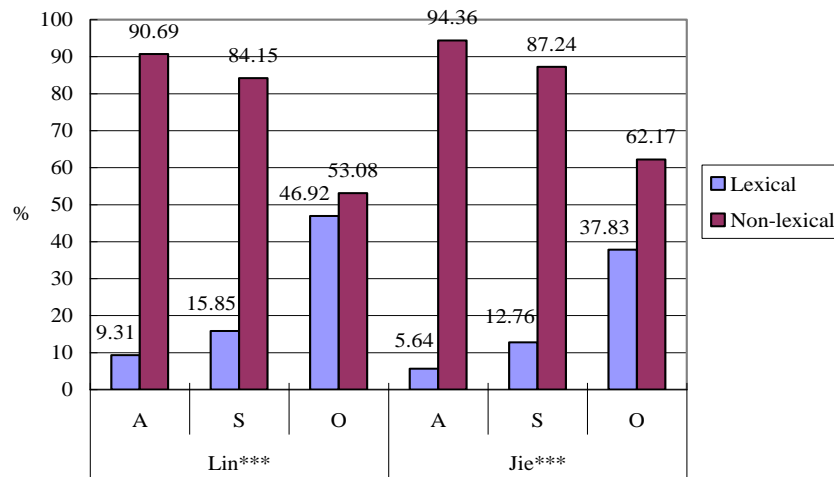
*** *p* < .001

Figure 1: Referential forms within each grammatical role

Moreover, the results of the residual analyses presented in Table 7 showed that both the A role and the S role together were significantly less likely to be lexical, while the O role was significantly more likely to be lexical in the data for both children. The results provided further evidence for the A/S vs. O opposition in the children's speech.

Table 7. Residual analysis: Referential forms

	A	S	O
Lin			
Lexical	-10.8▽	-4.9▽	15.3▲
Non-lexical	10.8▲	4.9▲	-15.3▽
Jie			
Lexical	-11.1▽	-5.0▽	16.1▲
Non-lexical	11.1▲	5.0▲	-16.1▽

▽: significantly low; ▲: significantly high; $p < .05$ if | adjusted residual | > 1.96; $p < .01$ if | adjusted residual | > 2.58; $p < .001$ if | adjusted residual | > 3.29

3.1.4 Given A Constraint

The Given A Constraint claims that new mentions avoid appearing in the A position. Table 8 presents the distributions of new mentions across the grammatical roles in the children's data. As seen in the table, the distributions were skewed toward the O role in the children's speech (73.75% and 65.26%); a much smaller proportion of new mentions appeared in the S role (19.17% and 29.58%), and only a few new mentions were found in the A role (7.08% and 5.16%). The children evidently avoided new A's; they also limited the use of new S's.

Table 8. New mentions across roles

	A		S		O		Total	
	N	%	N	%	N	%	N	%
Lin	17	7.08	46	19.17	177	73.75	240	100
Jie	11	5.16	63	29.58	139	65.26	213	100

The information statuses of the mentions were further analyzed to examine their distribution within each grammatical role. The results are presented in Figure 2. Figure 2 shows that non-new mentions occurred more frequently than new mentions in all of the grammatical roles in the speech of both children; however, there were also noticeable differences in the distributions. As seen in the figure, the majority of the A arguments and the S arguments were non-new: 97.01% of the A's and 88.78% of the S's were non-new in Lin's data, and 98.49% of the A's and 91.16% of the S's were non-new in Jie's data. In the O role, however, the proportions of new and non-new mentions differed less dramatically. In other words, arguments in the A and S roles were more likely to be non-new than those in the O role. It appears that the S role patterned with the A role rather than with the O role. Chi-square analyses were further conducted to examine the distributions of new and non-new mentions in the grammatical roles. The results showed that the distributions of new and non-new mentions were significantly different in the A, S and O roles in Lin's speech as well as in Jie's speech, suggesting that the children's use of new and non-new mentions was influenced by grammatical roles.
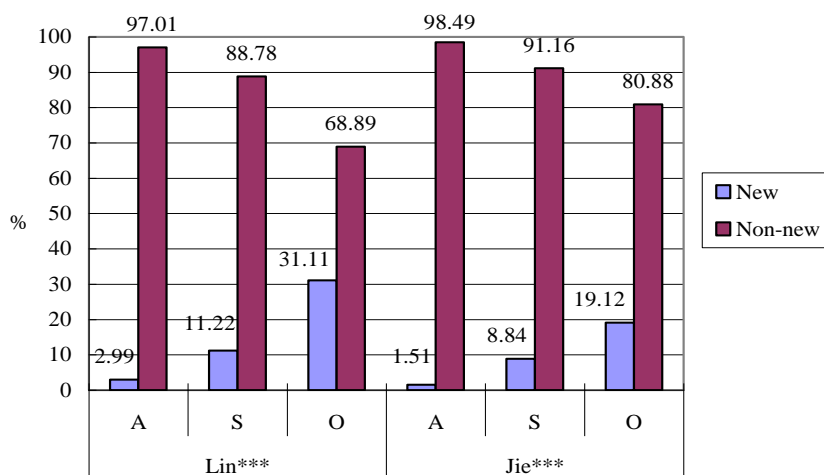
*** *p* < .001

Figure 2: Information status within each grammatical role

In addition, the results of the residual analyses in Table 9 showed that in Lin's speech both the A role and the S role together were significantly less likely to accommodate new mentions, while the O role was significantly more likely to contain new mentions. In Jie's data, the S role also in general patterned with the A role rather than with the O role, although the result did not reach statistical significance. The results thus indicated that the S role aligned itself more closely with the A role than with the O role.

Table 9. Residual analysis: Information status

	A	S	O
Lin			
New	-10.4▽	-2.8▽	12.9▲
Non-new	10.4▲	2.8▲	-12.9▽
Jie			
New	-9.2▽	-1.1 n.s.	10.3▲
Non-new	9.2▲	1.1 n.s.	-10.3▽

▽: significantly low; ▲: significantly high; $p < .05$ if │ adjusted residual │ > 1.96; $p < .01$ if │ adjusted residual │ > 2.58; $p < .001$ if │ adjusted residual │ > 3.29.

In sum, the two role constraints were found to hold for not only the A role but also the S role. In other words, our Mandarin child data exhibited an A/S alignment of referent distribution, reflecting the pattern observed in Mandarin adult speech.

Examples 3 and 4 illustrate such A/S alignment. As seen in Example 3, the A role of the transitive clause is non-lexical (and non-new) while the O role is lexical (and new). In Example 4, the S role of the intransitive clause is non-lexical (and non-new).

(3) Lin, #6, 2;6
(LIN and MOT are reading a story book).

*MOT:	請問	喵咪	在	做	什麼?
	qingwen	miaomi	zai	zuo	shenme
	may I ask	kitten	IPRF	do	what

'May I ask what the kitten is doing?'

*LIN:	拉	提琴.	←
	la	tiqin	
	play	violin	

'(He's) playing the violin.'

(4) Jie, #34, 3;1

*MOT:	<灰姑娘> [/]	灰姑娘	是	誰?
	<huiguniang> [/]	huiguniang	shi	shei
	Cinderella	Cinderella	COP	who

'Who is Cinderella?'

*JIE:	是	公主.	←
	shi	gongzhu	
	COP	princess	

'(She) is a princess.'

3.2 Human-ness and Accusativity

The analysis has shown that our Mandarin child data, consistent with Mandarin adult speech, demonstrated an accusative patterning, i.e., an alignment between the A role and the S role. This section aims to investigate whether the accusative pattern can be explained by the account suggested by Everett (2009), i.e., that there is a tendency for the O role to accommodate non-human referents, and for the A and S roles to accommodate human referents.

3.2.1 The association between human-ness and grammatical roles

Table 10 presents the distributions of human referents across the grammatical roles in the children's data. As seen in the table, human mentions appeared mostly in the A role in the speech of both children (60.02% and 62.92%); they rarely occurred in the O role (10.80% and 10.09%), and the rate of human mentions in the S role fell between these extremes (29.17% and 26.98%).

Table 10. Human mentions across roles

	A		S		O		Total	
	N	%	N	%	N	%	N	%
Lin	500	60.02	243	29.17	90	10.80	833	100.00
Jie	611	62.92	262	26.98	98	10.09	971	100.00

Further analysis was conducted to examine the distribution of human and non-human referents within each grammatical role. The results are presented in Table 11. As seen in the table, the majority of the A arguments were human in the two children's speech (87.87% and 84.04%). In contrast, the majority of the O arguments were non-human (84.18% and 86.52%). The S role hosts human referents at a higher rate than the O role, but at a lower rate than the A role (59.27% and 36.75%). Chi-square analyses reached statistical significance for the data for both children, indicating that the distributions of human and non-human referents differed across the grammatical roles.

Table 11. Human and non-human mentions within each role

	A		S		O		χ^2
	N	%	N	%	N	%	
Lin							
Human	500	87.87	243	59.27	90	15.82	601.00***
Non-human	69	12.13	167	40.73	479	84.18	
Total	569	100	410	100	569	100	
Jie							
Human	611	84.04	262	36.75	98	13.48	759.81***
Non-human	116	15.96	451	63.25	629	86.52	
Total	727	100	713	100	727	100	

*** $p < .001$

In sum, the results demonstrated that the feature of human-ness was associated with the grammatical roles in the data. The A role tended to contain human mentions, and the O role, non-human mentions; the S role appeared as an intermediate category when contrasted with the A and O roles.

Examples 5 and 6 illustrate the association between human-ness and grammatical roles. Examination of Example 5 shows that the A role of the transitive clause contains a human mention while the O role contains a non-human mention. In Example 6, the S role of the intransitive clause contains a human mention.

(5) Lin, #2, 2; 2

*MOT:	想	睡覺	嗎?		
	xiang	shuijiao	ma		
	want	sleep	QST		
	'Are you sleepy?'				
*LIN:	/m -: /	我	要	喝	奶奶. ←
	/m -:/	wo	yao	he	nainai
	um	1SG	want	drink	milk
	'Um, I want to drink milk.'				

(6) Jie, #34, 3;1
   (JIE is having dinner. MOT asks JIE whether one will grow taller
    after eating fish.)

*MOT:	YB	哥哥	點點頭	耶.
	(name)	gege	diandiantou	ye
	YB	big brother	nod	PRT
	'Big brother YB is nodding.'			
*JIE:	我	也	點點頭.	←
	wo	ye	diandiantou	
	1SG	also	nod	
	'I am nodding, too.'			

3.2.2 The association between human-ness and referential forms /
information status

Table 12 presents the distribution of the referential forms used for
human and non-human mentions. As shown in the table, non-human
referents were represented by a higher percentage of lexical forms than
human referents in the speech of the two children (40.14% vs. 11.76% in
Lin's speech, and 28.43% vs. 6.9% in Jie's speech). In contrast, human
referents were more likely to be non-lexical than non-human referents
(88.24% vs. 59.86% in Lin's speech, and 93.1% vs. 71.57% in Jie's
speech). Chi-square analyses were conducted to examine the

distributions. The results showed that the relationship between human-ness and referential forms was statistically significant in the speech of the two children.

Table 12. Referential forms for human and non-human mentions

	Human		Non-human		χ^2
	N	%	N	%	
Lin					
Lexical	98	11.76	287	40.14	165.79***
Non-lexical	735	88.24	428	59.86	
Total	833	100	715	100	
Jie					
Lexical	67	6.9	340	28.43	162.82***
Non-lexical	904	93.1	856	71.57	
Total	971	100	1196	100	

*** $p < .001$

Table 13 presents the relationship between human-ness and information status. As shown in the table, non-human referents were more likely to be new than human referents in the children's speech (27.27%% vs. 5.40% in Lin's speech, and 16.39% vs. 1.75 in Jie's speech). In contrast, human referents were more likely to be non-new than non-human referents (94.60% vs. 72.73% in Lin's speech, and 98.25% vs. 83.61% in Jie's speech). Chi-square analyses showed that the relationship between human-ness and information status was also statistically significant in the two children's data.

Table 13. Information status for human and non-human mentions

	Human		Non-human		χ^2
	N	%	N	%	
Lin					
New	45	5.40	195	27.27	140.48***
Non-new	788	94.60	520	72.73	
Total	833	100	715	100	
Jie					
New	17	1.75	196	16.39	129.55***
Non-new	954	98.25	1000	83.61	
Total	971	100	1196	100	

*** $p < .001$

The results above revealed that the feature of human-ness was associated with the referential forms of arguments and the information status of referents. That is, non-human mentions were more likely than human mentions to be lexical and new.

To sum up, the results in Sections 3.2.1 and 3.2.2 demonstrated an association between non-human referents and the O role, and an association between non-human referents and lexical/new arguments. Thus, as suggested by Everett (2009), the finding that lexical/new mentions were used mostly in the O role, as indicated in Preferred Argument Structure, may be due primarily to the fact that non-human referents so rarely occurred in the A/S roles.

3.2.3 The human-ness account

However, to have a more complete picture of this human-ness account, further investigation is needed. Sections 3.2.3 and 3.2.4 provide finer-grained analyses for this account.

If human-ness is the major factor underlying the patterns observed in Preferred Argument Structure, as suggested by Everett (2009), we would expect that lexical/new arguments would tend to have non-human referents, regardless of the grammatical role of the argument. Further

analysis was conducted to examine human and non-human mentions in each grammatical role.

Table 14 presents the analysis of the referential forms used for human and non-human referents in the A role, the S role, and the O role in the children's speech. The results showed that regardless of the grammatical role of the argument, lexical arguments were more likely to represent non-human referents, and non-lexical arguments were more likely to represent human referents. Chi-square analyses revealed that, except in the case of the A role in Lin's speech, all of the other results reached statistical significance.

Table 14: Referential Forms for human/non-human A, S, O

		Lexical		Non-lexical		χ^2
		N	%	N	%	
Lin						
A	Human	45	9.00	455	91	*n.s.*
	Non-human	8	11.59	61	88.41	
S	Human	29	11.93	214	88.07	6.87**
	Non-human	36	21.56	131	78.44	
O	Human	24	26.67	66	73.33	17.62***
	Non-human	243	50.73	236	49.27	
Lin						
A	Human	26	4.26	585	95.74	13.79***
	Non-human	15	12.93	101	87.07	
S	Human	15	5.73	247	94.27	18.43***
	Non-human	76	16.85	375	83.15	
O	Human	26	26.53	72	73.47	6.15*
	Non-human	249	39.59	380	60.41	

* $p < .05$, ** $p < .01$, *** $p < .001$, *n.s.: not significant*

Similarly, Table 15 shows the analysis of the information status of human and non-human referents in the A role, the S role, and the O role in the children's speech. The results showed that regardless of the grammatical role of the argument, new mentions were more likely to represent non-human referents, and non-new arguments were more likely to represent human referents. Chi-square analyses revealed that, except in the case of the A role in Lin's speech, all of the other results reached statistical significance.

Table 15: Information status for human/non-human A, S, O

|		New		Non-new		χ^2
		N	%	N	%	
Lin						
A	Human	14	2.80	486	97.20	*n.s.*
	Non-human	3	4.35	66	95.65	
S	Human	17	7.00	226	93.00	10.68**
	Non-human	29	17.37	138	82.63	
O	Human	14	15.56	76	84.44	12.07***
	Non-human	163	34.03	316	65.97	
Lin						
A	Human	5	0.82	606	99.18	9.65**
	Non-human	6	5.17	110	94.83	
S	Human	5	1.91	257	98.09	24.68***
	Non-human	58	12.86	393	87.14	
O	Human	7	7.14	91	92.86	10.51***
	Non-human	132	20.99	497	79.01	

** p < .01, *** p < .001, n.s.: not significant

The findings demonstrated that the feature of human-ness was associated with the status of an argument in being lexical/non-lexical or new/non-new in the A, S and O roles. In other words, lexical/new arguments tended to have non-human referents, and non-lexical/non-new arguments tended to have human referents, regardless of the grammatical role of the argument.

3.2.4 Significance of role types

As shown above, non-human referents were more likely than human referents to be represented via lexical/new arguments, in any of the A, S, or O roles. However, such results did not seem to describe the complete picture. Careful scrutiny of the results in Tables 14 and 15 showed that role types were also significant in the sense that the grammatical roles were quite dissimilar in terms of rates of new/lexical arguments. As seen in the tables, non-human O's were more likely to be lexical/new than non-human S's and non-human A's in the children's data.

To further explore the effect of role types, the factor of human-ness was controlled in the following analyses; that is, human referents and non-human referents were examined separately in terms of grammatical roles and referential forms / information status. Figure 3 shows the analysis of human referents; the figure presents the distributions of the referential forms for human referents within each grammatical role in the children's speech. The results showed that human O's were more likely to be lexical (26.67% and 26.53%) than human S's (11.93% and 5.73%) or human A's (9.00% and 4.26%) in the children's speech. In contrast, human O's were less likely to be non-lexical than human S's or human A's. Chi-square analyses were conducted to examine the distributions, and the results revealed statistical significance in Lin's speech and Jie's speech. In other words, the role in which a human argument occurred influenced whether a lexical or a non-lexical form was more likely to be used.
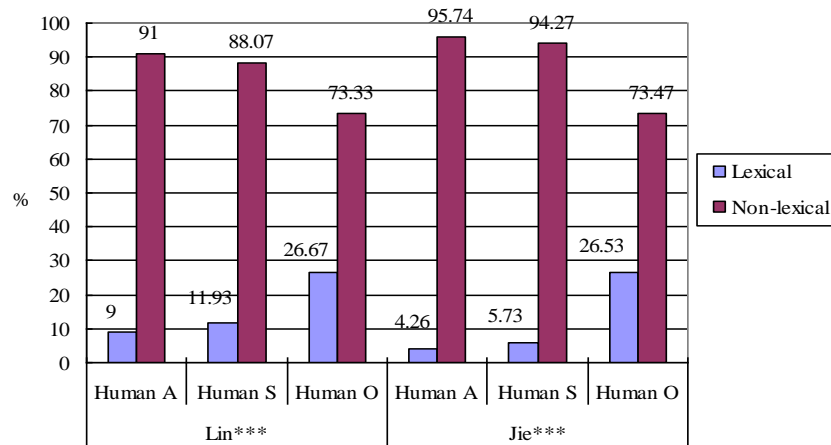
*** *p* < .001
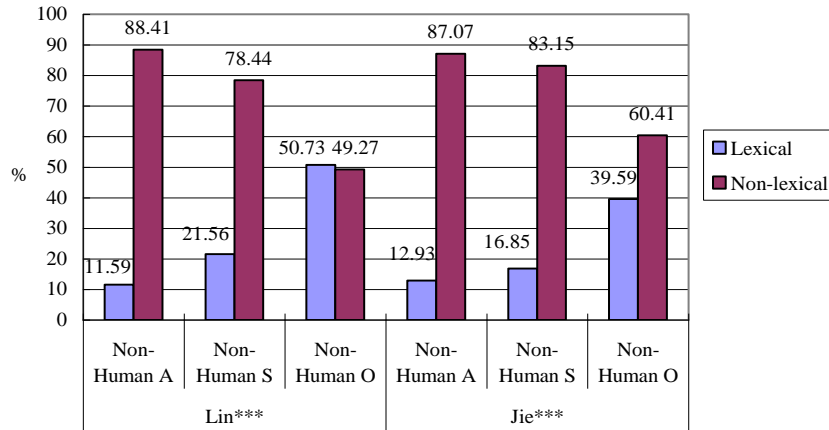
Figure 3: Human A/S/O and referential forms

In order to understand which roles contributed to the significant difference in the Chi-square analyses, residual analyses were further conducted, as shown in Table 16. Table 16 indicates that in the children's speech, the A role was significantly less likely to be lexical, that the O role was significantly more likely to be lexical, and that the distribution in the S role did not reach significance. In other words, a human referent was less likely to be represented by a lexical form if the referent was mentioned in the A role. In contrast, a human referent was more likely to be represented by a lexical form if the referent was mentioned in the O role.

Table 16. Residual analysis: Referential forms for human A/S/O

	Human A	Human S	Human O
Lin			
Lexical	-3.0▽	0.1 n.s.	4.6▲
Non-lexical	3.0▲	-0.1 n.s.	-4.6▽
Jie			
Lexical	-4.2▽	-0.9 n.s.	8.1▲
Non-lexical	4.2▲	0.9 n.s.	-8.1▽

▽: significantly low; ▲: significantly high; $p < .05$ if │ adjusted residual │ > 1.96; $p < .01$ if │ adjusted residual │ > 2.58; $p < .001$ if │ adjusted residual │ > 3.29.

Non-human referents were also analyzed, and Figure 4 demonstrates the distributions of referential forms for non-human referents within each grammatical role in the children's speech. Similarly, the results showed that non-human O's were more likely to be lexical (50.73% and 39.59%) than non-human S's (21.56% and 16.85%) and non-human A's (11.59% and 12.93%) in the children's speech. In contrast, non-human O's were less likely to be non-lexical than non-human S's and non-human A's. Chi-square analyses were conducted to examine the distributions, and the results revealed statistical significance in both Lin's speech and Jie's speech. In other words, the role in which a non-human argument occurred also influenced whether a lexical or a non-lexical form was more likely to be used.

*** *p* < .001

Figure 4: Non-human A/S/O and referential forms

Moreover, the residual analyses presented in Table 17 showed that both the A role and the S role together were significantly less likely to be lexical while the O role was significantly more likely to be lexical. The patterns were observed in the speech of both children. In other words, a non-human referent was less likely to be represented by a lexical form if the referent was mentioned in the A role or the S role than if it was mentioned in the O role. In contrast, a non-human referent was more likely to be represented by a lexical form if the referent was mentioned in the O role than if it was mentioned in the A role or the S role.

Table 17. Residual analysis: Referential forms for non-human A/S/O

	Non-human A	Non-human S	Non-human O
Lin			
Lexical	-5.1▽	-5.6▽	8.2▲
Non-lexical	5.1▲	5.6▲	-8.2▽
Jie			
Lexical	-3.9▽	-6.9▽	9.0▲
Non-lexical	3.9▲	6.9▲	-9.0▽

▽: significantly low; ▲: significantly high; $p < .05$ if │ adjusted residual │ > 1.96; $p < .01$ if │ adjusted residual │ > 2.58; $p < .001$ if │ adjusted residual │ > 3.29.

The results above thus revealed that when taking into account the human-ness of referents, role types still played a significant role in determining the referential form of a referent. O's were more likely to be lexical than S's and A', regardless of the human-ness of the referent. S's in general patterned with A's rather than with O's. Interestingly, this pattern is consistent with the overall A/S alignment observed in the data.

Examples 7, 8, 9, and 10 illustrate how role types are associated with referential forms for human mentions and for non-human mentions. Example 7 demonstrates a transitive clause in which both the A role and the O role are human mentions, and Example 8 shows an intransitive clause in which the S role is also a human mention. As seen in the examples, the A role and the S role are non-lexical while the O role is lexical.

(7) Lin, #6, 2;6
     (LIN is pretending to be a pianist.)

*LIN: 媽媽 #   你   要   鋼琴師   嗎? ←
       mama #   ni   yao   gangqinshi   ma
       Mom   2SG   want pianist   QST
       Mom, do you need a pianist?
*MOT: 鋼琴師   喔 #   OK.
       gangqinshi   o #   OK
       pianist   o   OK
       'A pianist? OK.'

(8) Lin, #6, 2;6
     (MOT and LIN are playing a game.)

*LIN: 我們   先   休息   一下.   ←
        women   xian   xiuxi   yixia
        1PL   first break   a while
        'We'll first take a break for a while.'
*MOT: 休息   一下.
        xiuxi   yixia
        break   a while
        'Take a break for a while.'

Example 9 demonstrates a transitive clause in which both the A role and the O role are non-human mentions, and Example 10 shows an intransitive clause in which the S role is also a non-human mention. As seen in the examples, the A role and the S role are non-lexical while the O role is lexical.

(9) Lin, #6, 2;6
(MOT and LIN are talking about the types of food that are sold in McDonald's.)

*MOT:	還有	賣	什麼?	
	haiyou	mai	shenme	
	else	sell	what	
	'What else does (it) sell?'			
*LIN:	媽媽 #	還有	賣	魚條. ←
	mama #	haiyou	mai	yutiao
	Mom	else	sell	fish fingers
	'Mom, (it) also sells fish fingers.'			

(10) Jie, #34, 3;1
(JIE says that she does not like cranberry juice.)

*JIE:	因為	它	酸酸的. ←	
	yinwei	ta	suansuande	
	because	3SG	sour	
	'Because it tastes sour.'			
*MOT:	對	它	很	酸.
	dui	ta	hen	suan
	yes	3SG	very	sour
	'Yes, it tastes very sour.'			

In addition to the analysis of referential forms, further analysis was conducted to examine information status in relation to grammatical roles for human referents and non-human referents, respectively. The analyses of information status revealed similar results. As seen in Figure 5, human O's were more likely to be new (15.56% and 7.14%) than human S's (7% and 1.91%) and human A's (2.8% and 0.82%) in the children's speech. In contrast, human O's were less likely to be non-new than human S's and human A's. The results of the Chi-square analyses were significant. Furthermore, the results of the residual analyses presented in Table 18 showed that the A role was significantly less likely to be new; the O role was significantly more likely to be new, and the distribution in

the S role did not reach significance. In other words, a human referent was less likely to be new if the referent was mentioned in the A role. In contrast, a human referent was more likely to be new if the referent was mentioned in the O role.
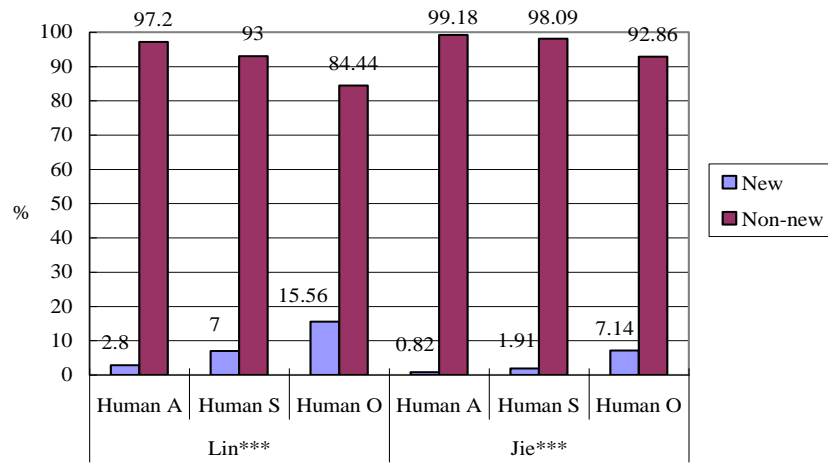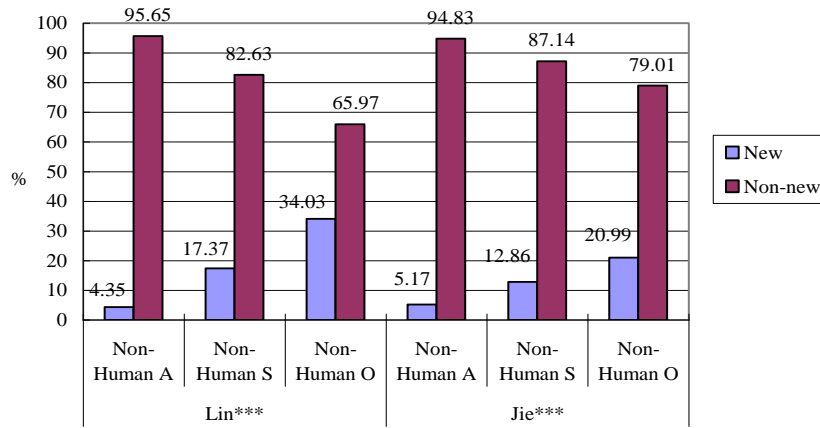

*** *p* < .001

Figure 5: Human A/S/O and information status

Table 18. Residual analysis: Information status of human A/S/O

	Human A	Human S	Human O
Lin			
New	-4.1▽	1.3 n.s.	4.5▲
Non-new	4.1▲	-1.3 n.s.	-4.5▽
Jie			
New	-2.9▽	0.2 n.s.	4.3▲
Non-new	2.9▲	-0.2 n.s.	-4.3▽

▽: significantly low; ▲: significantly high; $p < .05$ if │ adjusted residual │ > 1.96; $p < .01$ if │ adjusted residual │ > 2.58; $p < .001$ if │ adjusted residual │ > 3.29.

Figure 6 shows the analysis of non-human referents. Similarly, the results showed that non-human O's were more likely to be new (34.03% and 20.99%) than non-human S's (17.37% and 12.86%) and non-human A's (4.35% and 5.17%) in the children's speech. In contrast, non-human O's were less likely to be non-new than non-human S's and non-human A's. The results of the Chi-square analyses were significant. Moreover, residual analyses in Table 19 showed that both the A role and the S role together were significantly less likely to be new while the O role was significantly more likely to be new in the children's data. Thus, the results revealed that a non-human referent was less likely to be new if the referent was mentioned in the A role or the S role. In contrast, a non-human referent was more likely to be new if the referent was mentioned in the O role.

*** *p* < .001

Figure 6: Non-human A/S/O and information status

Table 19. Residual analysis: Information status of non-human A/S/O

	Non-human A	Non-human S	Non-human O
Lin			
New	-4.5▽	-3.3▽	5.8▲
Non-new	4.5▲	3.3▲	-5.8▽
Jie			
New	-3.4▽	-2.6▽	4.5▲
Non-new	3.4▲	2.6▲	-4.5▽

▽: significantly low; ▲: significantly high; *p* < .05 if │ adjusted residual │ > 1.96; *p* < .01 if │ adjusted residual │ > 2.58; *p* < .001 if │ adjusted residual │ > 3.29.

The results further demonstrated the significance of role types. O's were more likely to be new than S's and A's, regardless of the human-ness of the referent. In other words, S's in general patterned with A's rather than with O's, which is also consistent with the overall pattern of an A/S alignment in the data.

Examples 7, 8, 9, and 10, can also be used to illustrate the association between role types and information status for human mentions and for non-human mentions. Example 7 shows a human A and a human O while Example 8, a human S. As seen in the examples, the human A and the human S are non-new while the human O is new. In addition, Example 9 shows a non-human A and a non-human O while Example 10, a non-human S. Similarly, the non-human A and the non-human S are non-new while the non-human O is new.

To sum up, the analyses above revealed that while the feature of human-ness was an important factor contributing to the patterns of referent distribution observed in the data, the factor of role types also played a significant role. There may be a cumulative effect of the two factors. As shown in the results, non-human O's contained the highest percentage of lexical/new mentions among all of the argument types.

4. DISCUSSION

This study investigated whether Preferred Argument Structure is characteristic of early child Mandarin, and whether early child Mandarin exhibits an A/S alignment of referent distribution, reflecting the pattern observed in Mandarin adult speech. In addition, we also examined whether the patterns observed in child Mandarin can be explained by the account of human-ness suggested by Everett (2009).

The results showed that while Mandarin child language conforms to the constraints of Preferred Argument Structure, it does not support the hypothesis of an ergative structuring of discourse. It was shown that the constraints on the A role can hold for the S role as well. The results thus revealed that early child Mandarin exhibits an A/S alignment, which is consistent with the accusative patterning observed in Mandarin adult speech.

Du Bois suggested a cognitive motivation for Preferred Argument Structure, i.e., that there exists an architecture for cognitive processing, in which S and O are reserved for the high cost work of the introduction of new referents. This cognitive motivation, however, has been questioned by a number of studies, including Everett (2009) and the

present one. Empirically, the ergative pattern suggested by the cognitive account does not appear to be a universal phenomenon. Theoretically, the cognitive motivation may not be the most parsimonious account. Everett suggested that the well-established semantic and pragmatic factors regarding human-ness provide a better and more parsimonious account for the distribution of given/new referents. That is, it was argued that the feature of human-ness can better predict and explain new referent introduction than the hypothesized 'staging area'. While acknowledging the significance of the human-ness feature, this study further demonstrated that the factor of role types also needs to be taken into consideration in order to more fully account for the patterns of referent distribution.

The data revealed that the A role tends to accommodate human mentions, and the O role, non-human mentions, and that the S role behaves like an intermediate category when contrasted with the A and O roles. It appears that the S role is split into 'human S' and 'non-human S'. An interesting question would be whether a split-S alignment, as found in Acehnese (Durie 1987, 1988), can be observed in the data. Since the feature of human-ness is closely related to the pattern of referent distribution, such a split-S alignment is likely. However, as mentioned above, in addition to the factor of human-ness, the factor of role types also needs to be considered. As seen in the analysis, non-human S's tend to pattern with non-human A's rather than non-human O's. This role-type factor may have some effect on the pattern of the split-S alignment. Further analysis is needed in order to better understand how the human-ness factor and the role-type factor influence the grammatical alignment of the S role.

As shown in the results, the tendency for human mentions to be contained in the A role and the S role, as opposed to the O role, makes a significant contribution to the A/S alignment. An interesting observation is that the human A's and human S's in the children's data largely referred to the children themselves and, to a lesser extent, to their mothers (i.e., the addressees), which is a characteristic often observed in early mother-child interaction. The child and the mother were the most retrievable and active referents in the discourse. These self- and other-references were usually realized by the use of the pronominal

forms *wo* 'I' and *ni* 'you', or by the use of null forms. It appears that the children's frequent references to the self and to the mother in the A and S roles contribute to the given and the non-lexical A/S alignment observed in the data.

This study included both the analysis of referential forms and that of information status. The results showed that the distribution patterns of referential forms were generally similar to those of information statuses. There was a strong, but partial, relationship between referential forms and information status in the data. A consistent tendency shown in the analyses was that the percentage of lexical mentions was higher than that of new mentions in the children's speech (e.g., Figure 1 vs. Figure 2). This result is consistent with that reported in Clancy (2003) of Korean child data. As suggested by Clancy, the discrepancy between the rates of lexical mentions and of new mentions may be because that children have reasons other than information status for using lexical mentions, such as contrast (Allen, 2000; Clancy 1993, 1997; Huang, 2011). Conversely, there are also cases in which children use non-lexical forms for new mentions. These may occur when children use non-lexical forms with non-linguistic strategies, such as deictic gestures or eye gaze, to introduce new referents which are present in the physical setting (Guerriero et al., 2006; Huang, 2011). As pointed out by Clancy, the correlation between lexical mentions and new mentions may be weaker in the speech of young children than in adult speech. Further analysis is needed in order to better understand the relationship between referential forms and information status in language development.

The finding that child language also exhibits Preferred Argument Structure reveals the importance of investigating early grammar from a discourse perspective. As mentioned earlier, grammar and discourse are frequently treated as distinct domains in language acquisition research. Previous research on children's grammatical development has mainly focused on issues such as the measurement of syntactic growth, the feature of telegraphic speech, and the semantic relations of early utterances. As for the issue of argument realization, it has been suggested that the characteristic phenomenon of subject omission in child language is the result of the null-subject parameter (Hyams, 1986, 1989). Another type of explanation is from a performance perspective (Bloom, 1993;

Valian, 1991), which suggests that argument omission results from children's immature or limited processing resources (Bloom, 1993; Valian, 1991). The finding of the existence of Preferred Argument Structure in child language, however, implies that argument realization in early child language may be discourse-motivated. In Greenfield and Smith's (1976) seminal study, it was shown that English-speaking children even at the one-word stage tend to encode those aspects of events that are most informative (new information) and leave unexpressed those elements that are presupposed (given information). In recent research, a correlation between informativeness and argument realization has been observed in child language cross-linguistically in English (Greenfield and Smith, 1976; Guerriero, et al., 2006), Italian (Serratrice, 2005), Spanish (Paradis & Navarro, 2003), Korean (Clancy, 1993), Japanese (Guerriero, et al, 2006), and Inuktitut (Allen, 2000). Huang (2011) also demonstrated that Mandarin-speaking children's referential choice is made in accordance with the information status associated with the referent in question. In demonstrating that Mandarin-speaking children's speech exhibits Preferred Argument Structure, this study further showed that grammatical roles are correlated with the distribution of referents in relation to their discourse properties and to the morphological form in which they are represented. In addition, from the perspective of cognitive development, children's demonstration of Preferred Argument Structure also reveals their ability to take the perspectives of other people. That is, the development of a perspective-taking ability is essential in order for children to assess the information status of a given referent in the listener's mind in deciding their referential choice within the dynamics of communicative interaction (Huang, 2011). Thus, Preferred Argument Structure appears to reflect the links between children's grammatical development, pragmatic development, and cognitive development. Furthermore, the results showed that Mandarin child speech and Mandarin adult speech demonstrated a similar pattern of Preferred Argument Structure, suggesting that the acquisition of grammar may also be related to the referential strategies and the argument structures used by adults in conversations with young children (Clancy, 1997).

5. CONCLUSION

This study has shown that Preferred Argument Structure (Du Bois, 1987) is characteristic of early child Mandarin, and that both the factor of human-ness and that of role types contribute to the accusative patterning observed in the data. While further research is needed in order to determine the generalizability of the findings of this study, it is hoped that this study has shed some light on our understanding of how a use-oriented perspective can further our understanding of the links between grammar and discourse in child language acquisition.

REFERENCES

Allen, Shanley E. M. 2000. A discourse-pragmatic explanation for argument representation in child Inuktitut. *Linguistic*s 38:483-521.

Allen, Shanley E. M. and Heike Schröder. 2003. Preferred Argument Structure in early Inuktitut spontaneous speech data. *Preferred Argument Structure: Grammar as Architecture for Function,* ed. by John W. Du Bois, Lorraine E. Kumpf, and William J. Ashby, 301-338. Amsterdam: John Benjamins.

Ariel, Mira. 1990. *Assessing Noun-Phrases Antecedents*. London: Routledge.

Ariel, Mira. 1996. Referring expressions and the +/- coreference distinction. *Reference and Referent Accessibility*, ed. by Thorstein Fretheim, and Jeanette K. Gundel, 13-35. Amsterdam: John Benjamins.

Arnold, Jennifer E. 2003. Multiple constraints on reference forms: Null, pronominal, and full reference in Mapudungun. *Preferred Argument Structure: Grammar as Architecture for Function,* ed. by John W. Du Bois, Lorraine E. Kumpf, and William J. Ashby, 225-246. Amsterdam: John Benjamins.

Bentivoglio, Paola. 1996. *Acquisition of Preferred Argument Structure in Venezuelan Spanish.* Paper presented at the Seventh International Congress for the Study of Child language, Istanbul, Turkey.

Chafe, Wallace. 1976. Givenness, contrastiveness, definiteness, subjects, topics, and point of view. *Subject and Topic*, ed. by Charles Li, 25-55. London: Academic Press.

Chafe, Wallace. 1994. *Discourse, Consciousness, and Time: The Flow and Displacement of Conscious Experience in Speaking and Writing*. Chicago: University of Chicago Press.

Chafe, Wallace. 1996. Inferring identifiability and accessibility. *Reference and Referent Accessibility*, ed. by Thorstein Fretheim, and Jeanette K. Gundel, 37-46. Amsterdam: John Benjamins.

Clancy, Patricia. 1993. Preferred argument structure in Korean acquisition. *The Proceedings of the Twenty-Fifth Child Language Research Forum*, ed. by Eve V. Clark, 307-314. Stanford, CA: CSLI.

Clancy, Patricia. 1997. Discourse motivations for referential choice in Korean acquisition. *Japanese/Korean Linguistics Vol 6*, ed. by Ho-min Sohn and John Haig, 639-657. Stanford, CA: CSLI.

Clancy, Patricia. 2003. The lexicon in interaction: Developmental origins of Preferred Argument Structure in Korean. *Preferred Argument Structure: Grammar as Architecture for Function,* ed. by John W. Du Bois, Lorraine E. Kumpf, and William J. Ashby, 81-108. Amsterdam: John Benjamins.

Chui, Kawai. 1992. Preferred Argument Structure for Discourse Understanding. *Proceedings of the 14th conference on Computational linguistics (COLING92) vol. 4*, 1142-1146. Stroudsburg, PA: Association for Computational Linguistics.

Corston-Oliver, Simon H. 2003. Core arguments and the inversion of the nominal hierarchy in Roviana. *Preferred Argument Structure: Grammar as Architecture for Function,* ed. by John W. Du Bois, Lorraine E. Kumpf, and William J. Ashby, 273-300. Amsterdam: John Benjamins.

Dryer, Matthew. 1997. On the six-way word order typology. *Studies in Language* 21:69-103.

Du Bois, John W. 1985. Competing motivations. *Iconicity in Syntax*, ed. by John Haiman, 343-365. Amsterdam: John Benjamins.

Du Bois, John W. 1987. The discourse basis of ergativity. *Language* 63: 805-855.

Du Bois, John W. 2003a. Argument Structure: Grammar in use. *Preferred Argument Structure: Grammar as Architecture for Function,* ed. by John W. Du Bois, Lorraine E. Kumpf, and William J. Ashby, 11-60. Amsterdam: John Benjamins.

Du Bois, John W. 2003b. Discourse and grammar. *The New Psychology of Language: Cognitive and Functional Approaches to Language Structure, Vol. 2*, ed. by Michael Tomasello, 47-87. Mahwah, NJ: Lawrence Erlbaum.

Du Bois, John W., Lorranie. E. Kumpf and William. J. Ashby. 2003. *Preferred Argument Structure: Grammar as Architecture for Function.* Amsterdam: John Benjamins.

Everett, Caleb. 2009. A reconsideration of the motivations for preferred argument structure. *Studies in Language* 33.1:1-24.

Genetti, Carol and Laura D. Crain. 2003. Beyond Preferred Argument Structure: Sentences, pronouns, and given referents in Nepali. *Preferred Argument Structure: Grammar as Architecture for Function,* ed. by John W. Du Bois, Lorraine E. Kumpf, and William J. Ashby, 197-224. Amsterdam: John Benjamins.

Givón, Talmy. 1983. Topic continuity in discourse: An introduction. *Typological Studies in Language: Vol. 3. Topic Continuity in Discourse: A Quantitative Cross-Language Study,* ed. by Talmy Givón, 1-42. Amsterdam: John Benjamins.

Givón, Talmy. 1984. *Syntax: A Functional-Typological Introduction Vol. 1.* Amsterdam: John Benjamins.

Greenfield, Patricia Marks and Joshua H. Smith. 1976. *The Structure of Communication in Early Language Development.* New York: Academic Press.

Guerriero, Sonia, Yuriko Oshima-Takane and Yoko Kuriyama, 2006. The development of referential choice in English and Japanese: a discourse-pragmatic perspective. *Journal of Child Language* 33*:*823-857.

Halliday, Michael and Ruqaiya Hasan. 1976. *Cohesion in English.* London: Longman.

Haspelmath, Martin. 2006. Review of John W. Du Bois, Lorraine E. Kumpf and William J. Ashby, Preferred argument structure: Grammar as architecture for function. *Language* 83.4:908-912.

Helasvuo, Marja-Liisa. 2003. Argument splits in Finnish grammar and discourse. *Preferred Argument Structure: Grammar as Architecture for Function,* ed. by John W. Du Bois, Lorraine E. Kumpf, and William J. Ashby, 247-272. Amsterdam: John Benjamins.

Hopper, Paul J. and Sandra A. Thompson. 1980. Transitivity in grammar and discourse. *Language* 56:251-299.

Huang, Chiung-chih. 2011. Referential Choice in Mandarin Child Language: A Discourse-Pragmatic Perspective. *Journal of Pragmatics* 43:2057-2080.

Huang, Yan. 2000. *Anaphora: A Crosslinguistic Study*. Oxford: Oxford University Press.

Huang, Shuanfan and Kawai Chui. 2005. Is Chinese a pragmatic order language? *Typological Studies of Languages in China*, ed. by Chiu-yu Tseng, 51-79. Taipei: Academica Sinica.

Karkkainen, Elise. 1996. Preferred argument structure and subject role in American English conversational discourse. *Journal of Pragmatics* 25:675-701.

Kumagai, Yoshiharu. 2006. Information management in intransitive subjects: Some implications for the Preferred Argument Structure theory. *Journal of Pragmatics* 38:670-694.

Levison, Stephen. 1987. Pragmatics and the grammar of anaphor: A partial pragmatic reduction of binding and control phenomena. *Journal of Linguistics* 23: 379-434.

Levison, Stephen. 1991. Pragmatic reduction of the binding conditions revisited. *Journal of Linguistics* 27:107-161.

Lin, Wan-hua, 2009. Preferred argument structure in Chinese: A comparison among conversations, narratives and written texts. *The Proceedings of the 21ˢᵗ North American Conference on Chinese Linguistics (NACCL-21), Vol.2*, ed. by Yun Xiao, 341-357. Smithfield, Rhode Island: Bryant University.

MacWhinney, Brian. 2000. *The CHILDES Project: Tools for Analyzing Talk* (3rd ed.). Mahwah, NJ: Lawrence Erlbaum.

O'Dowd, Elizabeth. 1990. Discourse pressure, genre and grammatical alignment – After Du Bois. *Studies in Language* 14.2:365-403.

Paradis, Johanne and Samuel Navarro. 2003. Subject realization and crosslinguistic interference in the bilingual acquisition of Spanish and English: What is the role of input? *Journal of Child Language* 30:371-393.

Serratrice, Ludovica. 2005. The role of discourse pragmatics in the acquisition of subjects in Italian. *Applied Psycholinguistics* 26:437-462.

Chiung-chih Huang

Tao, Hongyin and Sandra A. Thompson. 1994. The discourse and grammar interface: Preferred clause structure in Mandarin conversation. *Journal of Chinese Language Teachers' Association* 29:1-34.

Chiung-chih Huang
Graduate Institute of Linguistics
National Chengchi University
Taipei, Taiwan 116, ROC
cchuang@nccu.edu.tw

166

APPENDIX

Transcription Conventions

-:	Previous word lengthened
[/]	Retracing without correction
#	Unfilled Pause

Gloss Abbreviations

1PL	First person plural
1SG	First person singular
2SG	Second person singular
3SG	Third person singular
COP	Copula
PRF	Perfective aspect
PRT	Discourse particle
QST	Question particle
IPRF	Imperfective aspect

Chiung-chih Huang

漢語兒童語言中的首選論元結構

黃瓊之
國立政治大學

本研究檢視是否「首選論元結構」(Du Bois, 1987)呈現於漢語兒童語言中，並且探討 Everett (2009)所提出的論點是否能夠解釋所獲得的研究結果。結果顯示漢語兒童語言符合首選論元結構的制約，但是並不符合其所假設的作格結構。語料中所觀察到的受格結構可以人類指涉因素(Everett, 2009)及語法角色因素來解釋。針對研究結果，本研究進一步以兒童對言談與語法間之聯繫的敏感度，以及成人與兒童對話時所使用的指涉策略加以討論。

關鍵字：首選論元結構、兒童語言、漢語