

WHO ARE YOU TALKING ABOUT?
THE DEVELOPMENT OF REFERENCE IN
CANTONESE-SPEAKING CHILDREN
WITH AND WITHOUT
SPECIFIC LANGUAGE IMPAIRMENT

by

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ABSTRACT

Cantonese-speaking children's reference to story characters was examined in three different functions: Maintenance of a known character, Introduction of a second new character, and Reintroduction of a known character. The notion of discourse representation, specified in terms of Levelt's (1989) knowledge components and attentional states, was used as the framework for understanding presupposition as cognitive process. Typically developing children aged 3, 5, 7 and 12 years and a group of 5-year-olds with specific language impairment, told 16 stories based on picture sequences. A child's referential act was judged to be adequate when a naive 'listener' could successfully identify the character.

All of the children were the most referentially adequate with Maintenance, less adequate with Introduction, and least adequate with Reintroduction. The 12- and 7-year-olds approached ceiling on all three functions, indicating accurate presupposition of the listener's knowledge of, and attention state towards, the story characters, as well as knowledge of the referring expressions. The 5-year-olds Maintained and Introduced characters clearly. They had the required expressions and made accurate presuppositions about the listener's knowledge. However, despite knowledge of the required expressions, they only showed partial success on Reintroduction, indicating difficulties in presupposing the listener's relative attentional state towards the character. The 3-year-olds were only referentially adequate on Maintenance. Despite knowledge of the required expressions, they appeared to ignore the listener's knowledge state.

Generally, children were more successful when Introducing or Reintroducing a character late rather than early in the discourse, suggesting that the salience of a new or returning character was a stronger determinant than the relative complexity of the discourse representation.

Cantonese-speaking children with SLI showed the same effects of referential function and discourse position. Some were at the same developmental level as their language-matched peers and some as their age-matched peers. However, they showed more difficulty with the required referring expressions than either group of children at the same levels. Future challenges would be to determine if children with SLI have problems with linguistic forms only, or with presuppositional skills as well.

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DEDICATION

In loving memory of my father, Shing Fat Wong (1922-1994)

PREFACE NOTE

Romanization for Cantonese Chinese

In this report, the Linguistic Society of Hong Kong Cantonese Romanization Scheme (1994) is adopted. The 6 tones (1: high level; 2: high rising; 3: mid level; 4: low falling; 5: low rising; 6: low level) are marked at the end of the syllable. Each of the Cantonese examples in the text is given in 3 levels: romanization of the characters, literal translation, and gloss as illustrated below:

go3 naam4 zai2

CL boy

(a) boy

Abbreviations

ASP	aspect marker
CL	noun classifier
L-PRT	linking particle
POSS	possessive marker
PRT	particle
V-PRT	verbal particle

CHAPTER ONE

LITERATURE REVIEW

1.1. INTRODUCTION

Communication success first and foremost requires clear and unmistakable reference to the entity, or referent, that is being talked about. A referent can be a physical object, a person, an event or an abstract concept. During the length of a discourse, a speaker¹ may talk about a number of different referents. The speaker's presupposition about the listener's knowledge determines that some referents may be new information e.g., *a friend*. At the same time, others may be considered as known information to the listener, as a result of common knowledge, e.g., *The Prime Minister*, prior shared experiences, e.g., *the movie*, or prior mention, e.g., "The woman who just came in? *She* is my sister." The listener's knowledge does not remain in a static state. During the length of a discourse, the same referent can change from new, e.g., "My sister gave me *a camera* for my birthday this year," to known information that is still being discussed, e.g., "*It* was exactly what I wanted. I also got...", to known information that has been mentioned earlier e.g., "But I have to admit I like *the camera* the best," as the discourse proceeds. As a result, the speaker has to change his presuppositions about the listener's knowledge of the referents during the discourse.

The speaker's presupposition about the listener's knowledge about a particular referent at the time of speaking is implicated in his choice of referring expressions. Languages have different forms of referring expressions, including

¹ For the ease of expression and comprehension, the speaker is referred as a he and the listener as a she throughout this paper.

lexical noun phrases, e.g., *a boy, the little kitten, this book*

noun phrases with a relative clause, e.g., *the boy who is wearing a hat*

proper names, e.g., *Julia, Tom*

pronouns, e.g., *he, she*

empty elements, e.g., *the Chinese null pronoun*

Each of these forms is appropriate for a specific presuppositional condition.

This project examines how Cantonese-speaking children learn to refer to entities, in this case persons in stories, over the preschool and primary school years. Children's referential adequacy in three different types of referential functions, as evaluated by listener judgment, will be measured, and the dominant form of referring expression for each of these referential functions will be identified. In addition to investigating the normal course of development of reference, the study will explore the possibility that reference presents special difficulties for Cantonese-speaking children with Specific Language Impairment (hereafter, SLI).

The notion of a discourse representation, conceptualized as a mental object, will be used to describe changes in the presupposed status of referents that are implicated in a speaker's use of referring expressions in discourse. This construct will also provide a focus for the discussion of developmental changes in children's reference. Reference is operationally defined here as a referential act in which the speaker uses an expression to designate to a listener the entity he is referring to (Brown & Yule, 1983; Maratsos, 1976). When the listener can successfully identify the referent at the moment of speaking, the reference is considered adequate. The use of a cognitive approach to the study of reference comes from an assumption that speaking is a moment-by-moment linguistic realization of the speaker's mental representation of the listener's knowledge, as well as his

representation of objects and judgments about these objects (Johnson-Laird & Garnham, 1980; Levelt, 1989). The remainder of this chapter presents these issues in greater detail as they have been discussed in the discourse literature.

1.2. PRAGMATIC REFERENCE IN DISCOURSE

When we talk, we express ideas in order that our listeners understand what we mean. In semantic terms, idea units are called propositions and are composed of a predicate, or judgment, about one or more arguments, or "objects." A predicate can be about a state, relation, change of state, or activity. An argument is the "object(s)" which necessarily participate(s) in the state, relation, change of state, or activity. This object(s) can be a person, thing, or event.

Suppose Speaker A says to you, "I met a guy at a party yesterday. Guess what? He works with Julia." This discourse example involves four different individuals: Speaker, you, a guy and Julia. Now you have just heard the two utterances. You would agree that you understand the Speaker's propositions. You know what judgments are being conveyed and who the judgments are about. The *meeting* judgment involves the Speaker and a guy. The *working* judgment involves a guy and Julia. However, the Speaker has told you more than you might be aware of. He has conveyed that:

1. Julia is a specific individual whom both the Speaker and you are both acquainted with.
2. The guy is a specific individual whom the Speaker has just met. The Speaker assumes that you have not met and hence do not know him, at least at the beginning of the discourse.

3. After the first utterance, the Speaker continues to talk about this guy, and he assumes that the guy is now 'known' to you.

How does the Speaker do that? The answer is through the choice of different referring expressions. The Speaker refers to Julia with a proper name (1), and to the specific individual whom you do not know, with an indefinite article + noun, *a guy* (2). After the Speaker has talked about this specific individual, he refers to him with the pronoun *he* in the subsequent utterance (3), as someone 'known' to you.

There is an extensive body of literature on reference from a number of disciplines: psycholinguistics, philosophy, and linguistics. The discourse example just presented illustrates the two aspects of reference that have most often been studied: semantic and pragmatic. The semantic aspect deals with "the relation between expressions in the language system and objects in the extralinguistic world, in brief, the word-world relation" (Xu, 1997, p. ix). Semantic properties of objects, including specificity, are realized by different expressions in a language depending on the speaker's own intention and perspective. When the speaker has in mind a particular entity (or entities), its reference will be specific. When the speaker does not intend to talk about any particular member of the class of entities, its reference will be nonspecific. The pragmatic aspect of reference, however, includes the receiving end of communication (e.g., Clark & Haviland, 1974). It is the speaker's presupposition about the listener's knowledge of the entities that determines the choice of different referring expressions. The speaker can presuppose that the entity is new or known information to the listener, or somewhat in between, when reference is made each time during the discourse.

These semantic and pragmatic distinctions concerning reference are shared across languages, but languages differ in the way they mark these distinctions. Generally, the

terms *definite* and *indefinite* are used to designate referring expressions for marking the given-new distinction. In some languages, there are distinct forms to mark specificity and definiteness, that is, the following contrasts exist: new + specific, new + nonspecific, given + specific, and given + nonspecific. In other languages, the distinction between specificity and definiteness is collapsed and, therefore, the same referring expressions mark both types of meanings at the same time. English is an example of such a language. In the sentence, *I saw a boy on the playground*, the noun phrase *a boy* refers to a specific individual who is new to the listener on first mention. Now consider another sentence, *I need a boy to play a part in the musical*. The noun phrase *a boy* here does not refer to any specific individual, who is nevertheless new information to the listener. As these two sample sentences illustrate, in English, indefinite noun phrases are used to refer to a new entity that can be either specific or nonspecific. However, if the two sentences were to continue, *the boy* would become known information to the listener and hence a definite expression *the boy* could be used for reference on subsequent mentions, regardless of whether initially the speaker had a specific boy in mind (Lyons, 1977). In Cantonese and Mandarin Chinese, the two distinctions are also collapsed, but in different ways than in English. In Chinese, word order and noun phrase types interact for marking semantic and pragmatic distinctions (Chao, 1968; Li & Thompson, 1981; Zhu, 1982). For example, the preverbal position can only be taken up by definite noun phrases for specific or known referents.

In this dissertation research, the focus was on children's development of the pragmatic aspect of reference in discourse. Cantonese-speaking children's presuppositions about the listener's knowledge of entities were systematically manipulated, whereas specificity of the referents was assumed.

1.3. FUNCTIONAL DISTINCTIONS REGARDING REFERENCE

The functional approach to the study of language examines forms in relation to the functions they achieve. In the case of reference, one can focus on contexts and examine how forms are used in texts to point to entities in the nonlinguistic and linguistic context (e.g., Halliday & Hasan, 1976), or examine how referents are identified through dynamic considerations of culture, text as well as context (Martin, 1985). One can also focus on the speaker's presupposition and investigate how different expressions map onto the listener's presumed knowledge about the referents (e.g., MacWhinney & Bates, 1978). In each of these attempts, language researchers have found certain distinctions useful in organizing their observations of language use. They will be reviewed here for understanding and interpretation of the development of reference in young children.

1.3.1. Distinctions related to contexts: Exophora versus Endophora

Some functional distinctions in regard to reference focus on the context in which an intended referent can be found. Referring expressions function as indexical devices, which identify the entity for the listener or reader, whether the entity is in the linguistic or nonlinguistic context (Halliday & Hasan, 1976). When the expression points to an entity that is currently and physically present in the nonlinguistic context, the reference is *exophoric* e.g., "Pass me *that cup* please?" For exophoric references, demonstratives e.g., this, nouns with demonstrative determiners e.g., that dog, or nouns with the definite article e.g., the dog, are often used. When the expression points to an entity within the linguistic context, the reference is *endophoric*. There are two types of endophoric reference. *Anaphoric* reference points back to an antecedent referring expression in the text, e.g., "Guess what, I got a puppy yesterday. *He* is so awfully cute." *Cataphoric* reference points forward to entity to be mentioned in the upcoming text, e.g., "Listen to *this*!" For

endophoric reference, pronouns, demonstratives, nouns with the definite article, and noun phrases which are co-referential with other noun phrases in the linguistic context are often used. Some forms of expressions can be used for both exophoric, e.g., “I want *that* one, please,” and endophoric reference, e.g., “*That* is a great idea!”

1.3.2. Distinctions related to presupposition

1.3.2.1 Given versus new information

Other functional distinctions focus on the speaker’s presupposition about the listener’s knowledge of the referent. The listener’s knowledge about the intended referent has initially been characterized as a dichotomous distinction between *given* and *new* information. Various definitions of given versus new information can be found in the linguistics and psycholinguistics literature (Chafe, 1976; Clark & Clark, 1977; Clark & Haviland, 1974; MacWhinney & Bates, 1978). Clark and Haviland (1974) define the contrast between given and new information as “Given information is what the listener is expected to know already by the speaker” (p. 512) and “new information is what the listener is not expected to know already by the speaker” (p. 512). When the referent is considered *given* information, the speaker expects the listener to be able to establish the existence and identity of the particular referent at the moment of speaking. On the other hand, when the referent is considered *new* information, the listener is not expected to be able to identify the referent at the moment of speaking.

A referent that is *given* information, i.e., a known referent, is coded by referring expressions that are *definite*, and a *new* referent is often coded by expressions that are *indefinite*. In English, definite expressions include noun phrases with the definite article

the, personal pronouns and ellipsis. Indefinite expressions include primarily noun phrases with the indefinite article *a*.

In a longer stretch of discourse, when a referent, once introduced, leaves and re-enters the discourse, the *given* versus *new* information dichotomy becomes inadequate. Let's look at two narrative examples:

A: "One early afternoon, a man was jogging in the park. All of a sudden, there was a call for help from one of the picnic tables. A teenager was lying on the ground, with blood pouring out from his head. Some of his friends were screaming. Some were sneaking away.** *The man* who was jogging came right over and immediately made a call to the police."

B: "One early afternoon, a woman was jogging in the park.** *She* ran into an accident just as she was ready to call it quits."

In excerpt A, the speaker has referred to *the man* as new information at the beginning of his narrative, so now when he continues (**), he cannot presuppose *the man* as new information to the listener again. *The man* is *given* information to the listener, though not immediately *given*. This is in contrast to the woman referent in excerpt B, whom the speaker also continues to talk about (**) after first mention. In this second case, however, there is no intervening reference to other characters. So on second mention, *the man* and *the woman* are known information to the listener in different degrees. This difference is implicated in the different referring expressions that are used as the narratives continue. In excerpt A, a noun phrase with a relative clause that is preceded by the definite article *the* is used to refer to the not-so-immediately given referent, whereas for the immediately given information in excerpt B, a pronoun is used. The dichotomous

distinction between *given* and *new* information needs to be finetuned for more precise characterization of the listener's knowledge about intended referents in discourse.

1.3.2.2. An expanded view of given versus new

Brown and Yule (1983) propose a system, elaborated from Prince (1981), that takes into account the transient nature of givenness of referents in discourse. Instead of a dichotomy, they describe information status in terms of a six category taxonomy, as follows:

Brand new entity: The speaker assumes that the entity is not in any way known to the listener, and he plans to introduce it in the discourse.

Unused new entity: The speaker assumes that the entity is known to the listener, as background knowledge, but is not in his consciousness at the time of reference.

Inferable entity: The speaker assumes that the listener can infer the entity from another entity which has already been introduced earlier in the discourse.

Situationally evoked entity: The speaker assumes that the entity is salient to the speaker from the discourse situation.

Textual current evoked entity: The entity has just been introduced as new in the discourse.

Textual displaced evoked entity: The entity has been introduced as new earlier in the discourse.

With these distinctions, Brown and Yule (1983) were able to identify a more complex pattern of distribution of English referring expressions. Speakers regularly refer to *brand new entities* with a noun with or without an identifying property; *unused new entities* with common names; *inferable entities* with definite expressions; *situationally*

evoked entities by personal pronouns; *current textual entities* with pronouns, ellipsis, and definite expressions; and *displaced textual entities* with definite expressions, often accompanied by an identifying property, but never with pronouns or ellipsis.

1.3.2.3. A cognitive view of given versus new

The given and new distinctions just reviewed focus primarily on the description of the listener's knowledge, but are vague about the nature of the speaker's presupposition about this knowledge. The speaker's presupposition has been specifically characterized in cognitive terms, as decisions about activation states in short-term memory (Chafe, 1976), accessibility levels (Givón, 1983), and cognitive statuses (Gundel, Hedberg, & Zacharski, 1993). These characterizations assert that presupposition is cognitive in nature and involves the speaker's evolving representation of the listener's attention state towards, as well as knowledge of, an intended referent. Language comes into play when the speaker chooses a referring expression to map onto the product of this presuppositional process. Chafe and Givón's schemes attempt to relate certain referring expressions in adult discourse to certain specific levels or states of the listener's knowledge, but they are not comprehensive and apply only to English (Chafe, 1976, 1987; Givón, 1983). Gundel et al.'s (1993) system was the first one to specify this expression-cognitive status correspondence systematically in detail, and to establish the correspondences across several languages.

Gundel et al. (1993) proposed six cognitive statuses, which aim to describe the speaker's different assumptions regarding the listener's memory of, and attention towards, an intended referent. The following is a list of the different statuses and the condition under which each status is met, taken verbatim from Gundel et al. (1993):

Type identifiable: The addressee is able to access a representation of the type of object described by the expression.

Referential: The speaker intends to refer to some particular object or objects.

Uniquely identifiable: The addressee can identify the speaker's intended referent on the basis of the nominal alone.

Familiar: The addressee can uniquely identify the intended referent on the basis of an existing representation in memory.

Activate: The referent is represented in current short-term memory.

In focus: The referent is at the current center of attention.

Each of the six statuses corresponds to specific forms of referring expressions, and the system appears to be universally relevant, at least with the languages Gundel et al. (1993) have examined, namely English, Mandarin Chinese, Japanese, Spanish, and Russian. The six statuses are implicationally related such that each status entails all 'lower' statuses but not vice versa. (In the list above the lowest status is listed first.) The use of a particular form indicates that the speaker believes the condition for its corresponding cognitive status and conditions for all lower statuses are met. For example, use of English *it* indicates that the speaker believes the referent is *in focus* and hence *familiar* and *uniquely identifiable*. However, not all *familiar* or *uniquely identifiable* entities would be *in focus*. Table 1.1 indicates the corresponding referring expressions and cognitive statuses in order from higher (left) to lower (right) as observed in English and Mandarin Chinese discourse:

TABLE 1.1

Cognitive Statuses and Their Corresponding Referring Expressions in Order from Higher (Left) to Lower (Right) as Observed in English and Mandarin

Expressions	Cognitive statuses					Type
	In focus	Activated	Familiar	Uniquely Identifiable	Referential	
						Identifiable
English	it, Ø ^a	that	that + N ^b	the + N	a + N	a + N
	s/he, they	this			this + N	
		this + N				
Mandarin	Ø	ta	--- ^c	nei + N	---	yi + N
(English	ta 's/he,it'	zhi 'this'		'that + N'		'one + N'
gloss)		nei 'that'				N
		zhi+ N 'this + N'				

a: Ø = zero nominal

b: N = noun

c: --- no corresponding forms
for this status

A unique feature of Gundel et al.'s (1993) system is the consideration of cognitive representation in terms of short-term as well as long-term memory, and attentional processes in linguistic encoding. Even though the definitions of some of the cognitive statuses are not written in terms of the speaker's assumptions, the authors emphasize that the cognitive statuses describe the speaker's different assumptions about the listener's memory of, and attention towards, an intended referent.

1.3.3. Summary and conclusions

Recent studies of reference, notably those of Gundel et al. (1993) and Brown and Yule (1983), have focused on the speaker's presupposition of the listener's knowledge and how it is associated with the expressions that refer to different referents in discourse. Moving beyond the simple dichotomy of *given* versus *new*, these writers posit a more elaborated continuum of givenness. *Information status* (Brown & Yule, 1983) and *cognitive status* (Gundel et al., 1993) seem to be two systems of description of the speaker's presupposition of the listener's knowledge about intended referents. Though not exact, we can see considerable correspondence between the two systems. Table 1.2. shows the correspondence between the different information and cognitive statuses.

TABLE 1.2

Correspondence Between Brown and Yule's (1983) Information Status and Gundel et al.'s (1993) Cognitive Status

Cognitive status	Information status
type identifiable	brand new entity
referential	situationally evoked entity
uniquely identifiable	inferable entity or unused new entity
familiar	unused new entity
activated	textual displaced evoked entity
in focus	textual current evoked entity

These two systems differ from approaches that focus on the listener's interpretation of cohesive relationships in a discourse (e.g., Halliday & Hasan, 1976). In the latter, analysis of reference and referring expressions centres on the contexts in which the referents can be found, e.g., linguistic versus immediate physical context, or antecedent versus precedent linguistic context relative to the current reference. Functional distinctions related to contexts differ in scope from those related to the speaker's presupposition, with the latter incorporating the former. Halliday and Hasan's (1976) distinctions can be incorporated into three of the categories in Gundel et al. (1993), or Brown and Yule (1983)'s system. For example, exophoric reference can be viewed as for situationally evoked entities, and endophoric reference for textually displaced or current evoked entities. Due to their larger scope and their compatibility with the developmental goals of this project, functional distinctions related to presupposition will be adopted as the analysis framework for the present study.

1.4. PRESUPPOSITION FOR REFERENCE

Gundel et al. (1993) and Brown and Yule (1983) argue that the use of a particular referring expression for an entity is associated with the speaker's presupposition of the listener's knowledge of that entity. The association is established from analyses of discourse samples as finished products. It is not clear, however, how the speaker makes presuppositions for reference to different entities, or the same entities, at different times during discourse production. A framework that conceptualizes the discourse as an evolving mental object will be helpful for our understanding of the process. In this section, I begin with an introduction to discourse models and then attempt to define the two types of presupposition that are necessary for reference in terms of cognitive processes.

1.4.1. Knowledge components and discourse models

A discourse model is a representation of a mental record of an individual's knowledge of the discourse as it evolves (Johnson-Laird & Garnham, 1980; Kamp, 1984; Prince, 1981; Webber, 1981). Hence, it is not an item in the long-term storage, but rather in the individual's active working memory. Johnson-Laird and Garnham (1980) first proposed that each discourse participant creates and maintains a separate representation of the current discourse, which consists of his knowledge of the entities, i.e., persons, things and events, their relations and properties, as well as what is known about the knowledge of the other participant(s). Levelt (1989) described how an individual speaker integrates his knowledge of the other participant(s) into his own representation of the discourse. According to Levelt, an individual's discourse representation includes four different components of knowledge. These components, as defined from the perspective of the participant who is the speaker at the time, are presented as follows (Levelt, 1989):

Common ground knowledge is the knowledge the speaker believes he shares with the listener, independent of the present discourse interaction.

Shared knowledge component from self (hereafter, shared knowledge:self) is the knowledge the speaker believes to have been successfully conveyed to the listener up to that point in discourse.

Shared knowledge component from other (hereafter, sharedknowledge:other) is the knowledge the speaker believes her listener has successfully contributed up to that point in discourse.

Knowledge the speaker intends to convey is the knowledge the speaker intends to convey but has not yet turned into linguistic expressions.

Levelt's (1989) notion of a *discourse model* specifies that it is a mental representation of the knowledge that has been communicated as the discourse evolves. It, therefore, includes only two of the knowledge types defined above: shared-knowledge:self and shared-knowledge:-other components. An individual's representation of the entire discourse, which includes all of the four knowledge components, will subsequently be referred to as *discourse representation*. When reference has been made to an entity, the entity is said to have an *address* in the discourse model. Relations and properties that have been communicated about the entity are *predications* added to the address.

Discourse participants use their representations of the discourse to both structure their messages when speaking and interpret utterances while listening (Johnson-Laird & Garnham, 1980). For the purpose of this project, I will focus on the knowledge representation of the discourse participant as speaker. Levelt (1989) proposed that the speaker organizes his message for subsequent grammatical and phonological encoding based on his representation of the entities, and their relations and properties in the four knowledge components. The next section will focus on how the speaker's representation of the entities is specified for subsequent encoding with various forms of referring expressions, according to Levelt's (1989) proposal.

1.4.2. Two types of presupposition: Knowledge components and attentional states

When the speaker encodes a message for his next utterance, he takes into account the *accessibility status* of each of the entities he is going to talk about. The status of a given entity guides the speaker's choice of a referring expression that will result in the listener's successful identification of that entity. Each entity can be assigned one of the these statuses (Levelt, 1989):

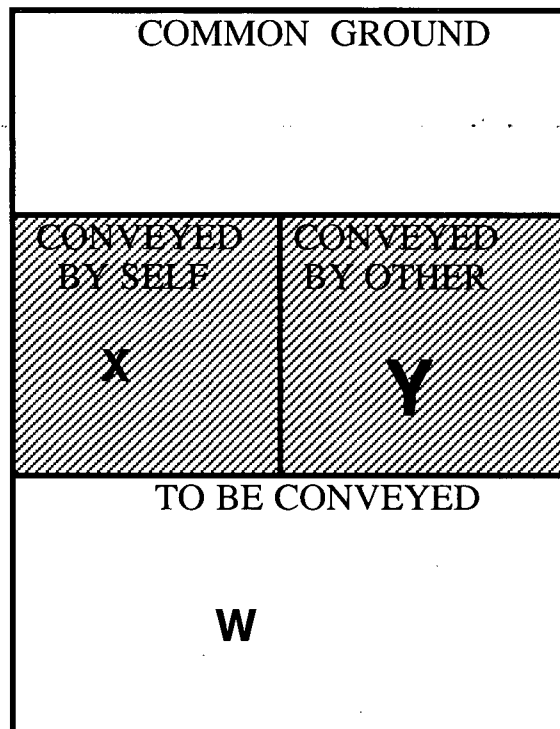
Inaccessible: At the moment of speaking, the entity is not in the common-ground-knowledge component, nor in the shared knowledge components in the speaker's discourse model. It is also not inferrable from entities in these components. The entity is in knowledge-the-speaker-intends-to-convey component, and therefore is not yet in the listener's discourse model. The English speaker typically uses an indefinite referring expression to encode inaccessible entities.

Accessible: At the moment of speaking, the entity is not in the common-ground-knowledge component, nor in the shared-knowledge components in the speaker's discourse model. But the speaker believes that the listener can infer the entity from entities in the common-ground-knowledge component or in the discourse model. For accessible entities, definite expressions are typically used.

In discourse model: At the moment of speaking, the entity already has an address either in the shared-knowledge:self, or the shared-knowledge:other, components in the speaker's discourse model. It is therefore a known referent to the listener, but the speaker estimates that it is not in her focus of attention. The English speaker typically uses definite expressions that are prosodically deaccentuated, relative to other expressions within the same utterance, to encode these referents (Brown & Yule, 1983; MacWhinney & Bates, 1978; Marslen-Wilson, 1982; Fowler & Housum, 1987).

In focus: At the moment of speaking, the entity is in the speaker's discourse model and the speaker assumes it to be in the listener's focus of attention. For these referents, the English speaker typically uses definite expressions that are reduced in various degrees (Chafe, 1976; Brown & Yule, 1983; Marslen-Wilson, Levy & Tyler, 1982; Prince, 1981) from bare nouns, to noun phrases with a definite article but no modifiers, to proforms such as pronouns, determiners *this*, *that*, or to zero elements. Fig. 1.1 illustrates how Levelt's

FIG. 1.1. An illustration of Levelt's (1989) discourse representation, including the different knowledge components and accessibility statuses.



Notes:

1. Entities are denoted by W, X and Y.
W: Inaccessible entity ; X and Y: entity in discourse model; Y: entity in focus.
2. The mental location of entities is noted by their location in the diagram.
3. The shaded sections make up Levelt's *discourse model*.
4. The listener's attentional focus is denoted by the size of the entity

(1989) different knowledge components and accessibility statuses are related in a speaker's discourse representation.

With the assignment of an accessibility status, the speaker's representation of an entity a discourse is specified on two dimensions: the knowledge component where it can be found and its attentional state. Levelt (1989) identifies only the first judgment, the specification of knowledge component as presupposition. More generally, however, presupposition is the process whereby the speaker makes background assumptions about the listener's knowledge (DeHart & Maratsos, 1984). If we define the listener's knowledge more broadly, the specification of attentional state can be identified as presupposition as well. By listener's knowledge we can mean the status of the entity as

indicated by its knowledge location, and also the status of an entity as the relative focus of attention. Gundel et al.'s (1993) definition of cognitive statuses also reflect this broader view of listener's knowledge.

To summarize the argument thus far, two types of presupposition seem to be required for grammatical encoding of an entity in reference. Defined in terms of cognitive processes, they are:

1. Presupposition of 'where' the entity is, a process whereby the speaker specifies the 'location' of the entity within one of the knowledge components.
2. Presupposition of the referent's attentional status, a process whereby the speaker specifies the degree to which the referent is in the listener's attentional focus.

1.4.3. Presupposition as cognitive process: An illustration

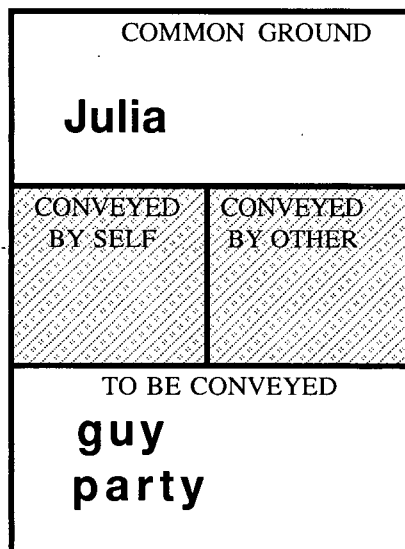
Levelt's (1989) notion of knowledge components, discourse models, and attentional states provides a framework for understanding presupposition as cognitive process. The following illustration will show how these conceptual tools help us understand how the speaker makes presuppositions for reference to entities at different times during discourse production.

Fig. 1.2, Fig. 1.3, and Fig. 1.4 represent the speaker's knowledge representation at different moments of speaking during the discourse. For the sake of simplicity, only the entities are indicated in the figures. Relations and properties of the entity are excluded.

Recall the discourse example given at the beginning of section 2:

Speaker: "I met a guy at a party yesterday. Guess what? He works with Julia".

FIG. 1.2. An illustration of the speaker's discourse representation at Time 1.

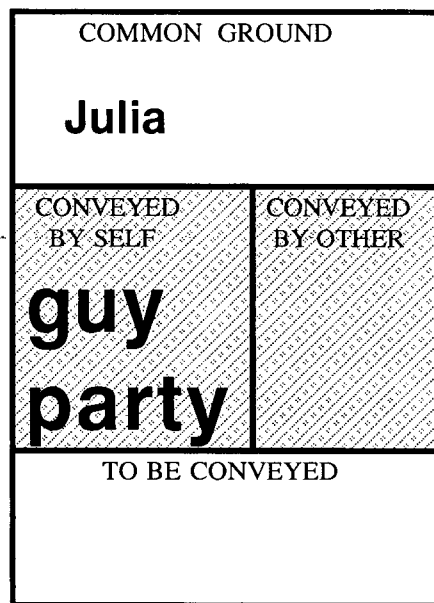


As illustrated in Fig. 1.2, at Time 1, the speaker is starting a conversation and is generating his first message. He makes presuppositions about the entities *guy* and *party* and specifies them in the knowledge-the-speaker-intends-to-convey component. (The entities *I* and *yesterday* relate to deictic relationships of person and time, notions that do not concern us here.) Based on his presupposition, the speaker uses corresponding referring expressions to grammatically encode the entities *guy* and *party*. In English, the appropriate indefinite referring expressions include the indefinite article *a* + noun. Here is the utterance the speaker produced, with the referring expressions italicized.

Utterance 1: "I met *a guy* at *a party* yesterday"

As illustrated in Fig. 1.3, at Time 2, now that reference has just been made to the entities *guy* and *party*, the speaker makes the presupposition that they are in his own discourse model, specifically in the shared-knowledge:self component, and that they are also in the listener's attentional focus. As the speaker plans for his next utterance, he also makes a presupposition that *Julia* is in the common-ground-knowledge component. Based

FIG. 1.3. An illustration of the speaker's discourse representation at Time 2.

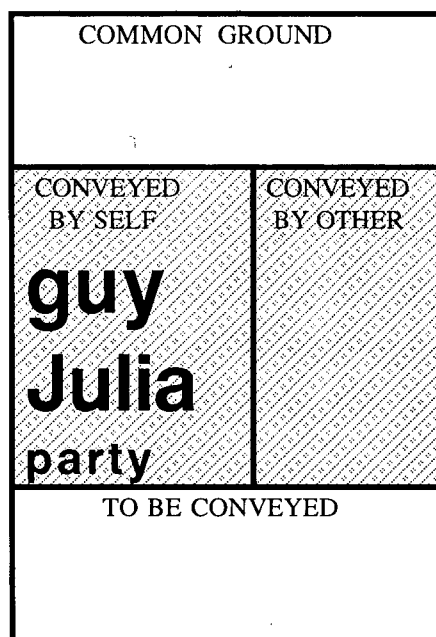


on this presupposition, the speaker uses corresponding referring expressions to grammatically encode the entities he intends to talk about. In English, the appropriate definite referring expressions include the definite article *the* + noun, pronouns and proper names. Here is the utterance the speaker produced, with the referring expressions italicized.

Utterances 2 and 3: "Guess what? *He* works with *Julia*.."

As illustrated in Fig. 1. 4, at Time 3, in his second utterance, the speaker has made reference to the entity *guy* again and the entity *Julia* for the first time. He does not need to update his representation of the listener's knowledge of the entity *guy* as it remains in his discourse model and in the listener's attentional focus. He does need to update his discourse representation in regard to the entity *Julia* who is now shared-knowledge:-self in the discourse model and is also in the listener's attentional focus. Since the *party* was not talked about in this utterance, the speaker also changes the status of that entity in the discourse model from *in-focus* to no longer in focus of attention.

FIG. 1.4. An illustration of the speaker's discourse representation at Time 3.



Based on the updated discourse representation, the speaker can make the presuppositions required by a third utterance if he continues his conversational turn. If he switches role to become the listener, his discourse representation will guide his interpretation of the next utterance in the context of the evolving discourse.

There are two things to keep in mind about this description of how the speaker makes presuppositions about the knowledge location of an entity and its attentional status during the generation of a message for subsequent grammatical encoding. First, it seems artificial to describe the generation of messages within a short conversational turn as occurring in discrete time periods, each ended by the production of an utterance. It is more likely that message generation and utterance formulation are overlapping and simultaneous processes.

Second, this illustration is certainly an overly simplified version of what happens during a real-life conversation, in both content and organization. It shows what goes on

only within a short turn at the very beginning of a conversation that involves only two people. Moreover, with the other person not yet contributing to the conversation, it resembles a monologue. If we allow the hypothetical discourse to continue, whether as a monologue or a conversation, there will be an accumulation of shared knowledge developed over the duration of the discourse. This shared knowledge will include predications as well as entities, and all elements in the shared-knowledge components will change in attention status from time to time as they are related to, or disconnected from, current propositions.

This description nevertheless makes it clear that each new utterance leads to changes in the speaker's representation of the entities, both in terms of knowledge component and attentional status. Therefore, any presuppositions that the speaker makes depend on the context of the discourse at a particular time.

1.5. THE DEVELOPMENT OF REFERENCE

To recapitulate, reference is a referential act in which the speaker uses a linguistic expression, such as a noun phrase or a pronoun, to designate to a listener the entity being talked about. Reference to an entity requires the speaker to make an appropriate presupposition about the listener's knowledge of the entity in the discourse, and to use a referring expression for the entity based on his presupposition of the listener's knowledge.

For a young child learning to speak and communicate, there are many capacities which must be in place prior to mastering reference in discourse. Among these are:

1. The ability to make accurate presuppositions about the knowledge component where the referent resides.
2. The ability to make accurate presuppositions about the attentional status of a referent.
3. The ability to make presuppositions at different positions in discourse.
4. Knowledge of the linguistic expressions needed to refer to entities in different knowledge components and attentional states.
5. Knowledge of the 'map' between referring expressions and presuppositions.
6. The ability to deploy this knowledge when needed.

In the coming sections, I review the literature on children's development of presuppositional skill (#1 above), and on Cantonese-speaking children's development of referring expressions (#4). Children's presuppositions regarding the attentional status of referents (#2), the influence of discourse position (#3), the mapping of presuppositions onto referring expressions (#5), and the deployment of this knowledge (#6) have not been studied. I will return to these issues when discussing the results of this project.

1.6. THE DEVELOPMENT OF THE PRESUPPOSITIONAL SKILLS FOR REFERENCE

A young child needs to have the ability to make accurate presuppositions about their listener's knowledge in order to make clear reference in discourse. There is no direct evidence of presuppositional skill, because it involves cognitive processes that are as yet not directly observable. This skill may, however, be inferred from the child's use of referring expressions for marking known and new referents in discourse. *Definiteness* and *indefiniteness* have generally been used to describe referring expressions that mark pragmatic distinctions among intended referents, in particular, distinctions as to whether

they are *known* or *new* information to the listener. The child can be said to truly have adequate presuppositional skill when he becomes able to make presuppositions in a discriminatory fashion, that is, to show contrastive use of definite and indefinite referring expressions. For example, a child with this ability would use a definite expression, e.g., *the dog*, when he talks about a specific dog known to the listener, and an indefinite expression, e.g., *a dog*, when he talks about a specific dog that the listener does not know yet.

The prerequisite for the ability to make accurate presuppositions is the child's awareness that the listener can have different knowledge than his own about the entities he might talk about. This awareness develops with the child's cognitive skills and social experiences. As he moves into the later preschool years, the child talks not only about entities and events in the immediate physical context, but also about those in more distant times and places. He talks not only with family members who have shared many of his experiences, but also with less familiar acquaintances. In these later discourse contexts, there is a natural knowledge gap between the child speaker and the listener. They cannot both see the entity the child refers to, or share mutual knowledge from prior experience. Such discourse contexts thus make accurate presupposition necessary for communication success, and presumably motivate its development.

At the youngest ages, evidence of presupposition is drawn primarily from naturalistic studies. In his analysis of three 3-year-old children's spontaneous productions, Brown (1973) noted that the children used inappropriate definite determiners to introduce referents that were neither present nor mutually known. On those occasions when they did use the appropriate indefinite determiners for referent introduction, they typically used them only to label referents that were present in the speech situation. Similar observations of English-speaking children were also reported by Atkinson (1979) and

Keenen and Schieffelin (1976). Mandarin-speaking children show similar behaviors, at least before 3 years of age. Min (1994) collected language samples from five Mandarin-speaking children, aged 11 months to 3 years, 5 months (3;5). Her analysis of these children's language samples, supplemented by elaborate contextual notes, indicates that the two 3-year-old children were beginning to use appropriate nominals with numeral determiners and classifiers to introduce new referents. However the nominals were sometimes used deictically, and it was often necessary for the listener to rely on nonlinguistic information from the physical context to identify referents.

In these naturalistic studies of children's development of referring expressions, a knowledge gap between speaker and listener was not experimentally manipulated and occurred only sporadically, if at all. A definitive statement about children's presuppositional skill cannot therefore be made from these studies. However, they do present some evidence that 3-year-old children do not understand that the listener may have different knowledge than his own about the entities being talked about. The observed children talked about an entity they knew as if their listener knew it too and hence could successfully identify it.

A group of experimental studies were designed such that there was a consistent knowledge gap between the child and the listener. The child was asked to tell stories from picture books which the listener could not see². Moreover, the child's use of referring expressions was examined for entities that were *new*, as well as entities that were *known*, to the listener. These two design features make it possible to find an answer to the question

² In other experimental and quasi-experimental studies on children's use of referring expressions in narrative discourse (e.g., Bamberg, 1987; Karmiloff-Smith, 1981, 1985; Wigglesworth, 1990), there was no knowledge gap between the child speaker and the listener. Since this experimental set up did not make it obligatory for the children to make presuppositions about the listener's knowledge, they will not be further considered here. They will be reviewed later, however, when the use of referring expressions for narrative coherence is discussed.

of when children demonstrate the presuppositional skill necessary for adequate reference to entities in discourse.

The last of the three experiments reported by Warden (1976) examined English speakers' use of indefinite and definite expressions for first and second or subsequent mention of referents in discourse. Four groups of children, aged 3, 5, 7 and 9 years, and a group of adults participated in the study. Each participant was asked to tell two 3-picture cartoon stories to another same-age participant who could not see the picture books. Each story involved three characters. Here is how the two stories could be told:

Story A

Picture 1: A dog is chasing a hen.

Picture 2: A cow stops the dog, and the hen runs to hide behind the cow.

Picture 3: The hen lays an egg.

Story B

Picture 1: A cat is walking under a tree, and a bird is sitting in the tree.

Picture 2: A dog chases the cat up the tree.

Picture 3: The bird flies away.

For second and subsequent mentions of the characters, participants across ages used definite referring expressions, e.g., *the dog*, *he*, at least 90% of the time. For referent introduction, however, age differences were found. The use of indefinite expressions e.g., *a bird*, for first mention increased with ages. The 3-, 5-, 7- and 9-year-old children and adults used indefinite expressions 46%, 62%, 61%, 82%, and 100% of the time respectively. Despite the similar percentages, the 5- and 7-year-olds showed qualitative differences in their use of indefinite expressions. While the 7-year-olds used indefinite

expressions to refer to their intended referent, e.g., "A *cat* is walking;" the 5-year-old children sometimes used them to name the entity, e.g., "It's *a cat*." Only the 9-year-old children and adults used significantly more indefinite expressions than definite expressions, and only adults consistently used indefinite expressions to introduce new referents. Warden (1976) concluded that 9 is the earliest age at which children demonstrate discriminative use of indefinite and definite expressions. Given 100% use of definite expressions for second and subsequent mentions, and 61% use of indefinite expressions primarily for first mentions (as opposed to naming), it could also be inferred from this study that children at 7 years began to show³ the presuppositional skill needed for reference to entities in narrative discourse.

Following the same experimental procedure as in Warden (1976), Emslie and Stevenson (1981) found quite a different pattern of development. In their first study, they examined English-speaking children's use of indefinite, e.g., indefinite article + noun, and definite referring expressions, e.g., definite article + noun, or pronouns for first mention of new referents and second mention of known referents in short stories. Ten adults and 30 children in three age groups, 2-year-olds, 3-year-olds, and 4-year-olds, participated. Each participant was asked to tell two cartoon stories to another participant. Both stories involved two animate and one inanimate object. Results indicated that all participants used predominantly indefinite articles on first mention of a referent, and all except the 2-year-old children used definite articles on second mention. The same group of subjects participated in a replication study. In this second study, instead of giving out the cartoon pictures one at a time as in the first study, Emslie and Stevenson (1981) allowed their participants to examine all of the pictures successively until they were ready to tell the story. These

³ Here and in subsequent reviews, the 60% to 70% range is accepted as the performance level for at least emerging appropriate use of indefinite referring expressions for first mentions, or definite expressions for second and subsequent mentions, of referents. The contrastive use of these expressions is not a binary

modifications were designed to help the participants, especially the 2-year-olds, to better appreciate the continuity of characters, and to heighten the contrast between known and new referents. The stories in this experiment were not the same as the ones used in the first study. Here is an example of one of the story picture sequences:

Picture 1: A woman and a little girl are standing beside the table. The little girl is reaching for a bottle of milk.

Picture 2: The little girl has dropped the bottle of milk and is kneeling on the floor beside the broken bottle. The woman has her hands to her mouth.

Picture 3: The little girl is kneeling on the floor and a cat is drinking the milk from the broken bottle.

Even with different stories and a different procedure, results from the first experiment were basically replicated. The 2-year-olds used definite expressions for second mention 60% of the time, while the other three groups used them 100% of the time. For first mention, the 2-, 3-, and 4-years-olds and adults used indefinite expressions 52%, 68%, 76% and 51%⁴ of the time, respectively. These results indicated that children as young as 3 years of age begin to demonstrate the presuppositional skill for reference to entities in a discourse. They used indefinite expressions for first mention of new referents 68% of the time, and used definite expressions for second mention of known referents all of the time.

In Japanese, the major referential choice is between ellipsis and nominals.

Nominals are used for introduction or reintroduction of referents into discourse. For

decision, as there are linguistic forms other than the specific referring expressions the researchers were interested in that would be appropriate (e.g., the use of a proper name).

maintenance of referents, ellipsis is generally used and at frequencies comparable to English pronouns in discourse (e.g., Clancy, 1992; Hinds, 1982). Pronouns do exist, but they are less common and carry different grammatical properties than their English counterparts.

Clancy (1992) examined the contrastive use of ellipsis and nominals in the narratives of Japanese speakers. Sixty children aged 3;8 to 7;4 and a group of adults participated in the study. Each of the participants told seven picture stories to a blindfolded adult listener, and retold a videotaped story to a listener who was absent during the viewing. The videotaped story was excerpted from a local television program that was familiar to the participants, and it was much more complex in terms of the number of characters, events, and themes, than the picture stories. Each of the picture stories consisted of five to nine frames linked together from left to right in plastic covers, with one or two main characters and one or more (often two) secondary characters. Before telling a given story, the child was told the name of each character in that story. Here is the essence of the THEFT story as shown in the pictures given in the appendix in Clancy (1992).

Picture 1: Yo is playing with his top. His bike is nearby, at the corner of the street.

Picture 2: Ko is peeking out from the corner. Yo is putting the string around the top.

Picture 3: Ko is now standing next to the bike. Yo has just set the top to spinning.

Picture 4: Ko is riding away with the bike. Yo is putting the string around the top again.

Picture 5: Yo is looking for his bike.

⁴The adults used definite expressions instead for first mention of some of the characters. The authors pointed out that the adults assumed that their adult listener could infer these characters from the context of the story with their knowledge of the world.

From these two narrative tasks, Japanese speakers' use of nominals was measured in three discourse contexts: a) introduction, i.e., first mention of a new story character; b) reintroduction, i.e., subsequent mention of a character in a subject NP, when it differs from the character referred to in the immediately prior main clause subject; c) maintenance, i.e., subsequent mention of the character referred to in the immediately prior main clause subject. Regardless of narrative task, children used more nominals for introduction than for reintroduction, and more for reintroduction than for maintenance. The use of nominals for introduction increased with age, with the sharpest increase (62 % to 85%) in the three groups under 5;4. The use of nominals for maintenance was at a low level (about 15%) across all the age groups. The overall usage pattern suggests that Japanese children between 4;4 and 4;8 are beginning to show presupposition for reference. They were found to use nominals for introduction at a relatively high level of about 70% and for maintenance only at about 12%.

In Mandarin Chinese, the distinction between referent introduction and maintenance is marked by means of both noun phrase types and clause structures. To introduce a referent for the first time, an adult speaker often uses indefinite noun phrases, e.g., nominals with numeral determiners and a classifier, in the postverbal position. To maintain a referent, definite nouns phrases, e.g., pronominals, bare or demonstrative nominals, are used preverbally.

Hickmann and Liang (1990) collected narratives from 49 children, aged 4, 5, 6, 7 and 10 years, and a group of nine adults. Each participant told two stories to a blindfolded adult listener based on pictures. Both stories had three different animal characters, but they differed in the number of picture frames, (five versus six). Here is the essence of the HORSE story as shown in the pictures given in Hickmann and Liang (1990):

Picture 1: A horse is running.

Picture 2: A cow is looking at the horse.

Picture 3: The horse is jumping over the fence.

Picture 4: The horse had an accident and fell.

Picture 5: A bird got some first aid supplies and helped the cow tie a bandage around the horse's leg.

Results indicated that the youngest group, the 4-year-old children, maintained reference to a character in ways similar to adults. They used the preverbal position at a level (88%) comparable to the adults. They also used bare nominals as the primary form of definite referring expression, as did the adults and other age groups. For referent introduction, however, the 4-year-old children continued to use primarily bare nominals. The 5-year-olds began to use nominals with a numeral determiner and a classifier, but not yet in the postverbal position. However, it was the 7- and 10-year-olds who used both indefinite referring expressions and the postverbal position for marking referent introduction. The more global clause structure marking apparently took the Mandarin-speaking children longer to master. Nevertheless, it can be inferred from the emerging contrastive use of referring expressions that children at 5 years of age are beginning to show presuppositional skill for reference.

As in Mandarin Chinese, the distinction between referent introduction and maintenance in Cantonese Chinese is also marked by means of both noun phrase types and clause structures. To introduce a new character, the appropriate indefinite referring expression is the existential expression, that is, a numeral noun phrase follows an existential verb *jau3*, e.g.,

jau3 jat1 go3 naam4 zai2

have one CL boy

'there is a boy'

Appropriate definite referring expressions for maintaining known characters include the null pronoun and the lexical pronoun *keoi3* (he/she) in the preverbal position.

A pilot study (Wong, 1998) was conducted to examine Cantonese-speaking children's contrastive use of referring expressions for marking known and new information in discourse. Thirty-four Cantonese-speaking children from three groups, aged 3, 4 and 5, participated in the study, in which they told 12 short stories to a listener who could not see the pictures. The 3-year-old children were found to use pronouns similarly for old and new referents at 58% and 42% respectively. This noncontrastive use of pronouns suggested that they were not making accurate presuppositions of the listener's knowledge. The appropriate use of existential expressions for new referents increased with age, most notably from 4 to 5 years of age, from 42% to 100%. The appropriate use of pronouns primarily for old referents was also solidly developed by 5. It can be inferred from these data that Cantonese-speaking 5-year-olds have the ability to make appropriate presupposition regarding their listener's knowledge.

What can we conclude from this literature review about the age at which children begin to demonstrate the presuppositional skill for reference in discourse? Thus far, most researchers would point to the period from mid-4 to 5 years, with exceptions identifying either 3 or 7 years of age. Given that presuppositional skill has to be inferred from the use of referring expressions, which may differ in linguistic complexity across languages, age differences might be expected across the studies of English-, Japanese-, Mandarin Chinese- and Cantonese Chinese-speaking children. However, the biggest performance difference

actually came from two of the studies of children learning English. This suggests that we must consider other explanations for age differences across studies.

Variability in the structural complexity of the stories used could be one reason for the wider age range (Hickmann, 1995; Wigglesworth, 1990). In many studies, there seems to have been an implicit assumption that a given referring act at one point of a story discourse is the same as at another point. The referring expression each child used for each referring act was scored and summarized by type of referential function, e.g., introduction versus maintenance or switching reference. However, there was no systematic control of the points at which a new character appeared, or a known character continued or returned to a story. The assumption about the irrelevance of discourse position has never been empirically evaluated but has certainly been raised as a potential problem in the interpretation of results from developmental studies. As Clancy (1992) remarked, "The specific circumstances of *each act of reference* (italics mine) define a particular set of cognitive, social and linguistic tasks for the child" (p.461). The discourse theories reviewed earlier clearly treat presupposition as an ongoing cognitive process that continues throughout the length of a discourse. The speaker needs to make presuppositions for reference to an entity considering the current state of the discourse at a particular moment of speaking, and these presuppositions must be constantly revisited as the discourse evolves. It is possible that it is easier for the child to make presuppositions at the beginning of a discourse than later in the discourse. If so, the child would be better able to use a referring expression to make clear reference to an entity in the first picture than in the third picture, or in shorter stories rather than longer ones. It is difficult to determine whether differences in discourse positions will explain the different results in the developmental studies. The study reporting the latest acquisition point (Warden, 1976) does not use the longest stories. But since the discourse positions for particular referential acts were neither systematically controlled nor reported, much uncertainty remains. One goal of the present study is to

investigate the influence of discourse position, and to do so for particular sorts of referential acts.

While it is true that there is some degree of variability, it is also true that there is considerable agreement regarding the age at which presupposition skill begins to be reliably clear. This raises the question of what else in development might be occurring at those ages. A comprehensive review would be beyond the scope of this chapter, but two things are worth noting, at least briefly. First, by 3 to 4 years, children have demonstrated considerable knowledge of the semantic contrasts that underlie presupposition. They distinguish reference to a specific object and any object from within the same class by the appropriate use of definite and indefinite articles (Maratsos, 1976). They also selectively verbalize in their sentences the new or changing elements while taking for granted the elements that continue in the situational context which they share with their communication partner (Skarakis & Greenfield, 1982). Second, late 3 to 4 years is the age when there is notable growth in children's understanding of mental events. They have shown themselves able to recognize that other people have beliefs, knowledge, and perspectives different from their own and that people behave according to these beliefs, knowledge and perspectives about people and objects (Wimmer & Perner, 1983). These two milestones in cognitive development might contribute to young children's development of the presupposition skill necessary for adequate reference in discourse.

Setting aside the issue of age, there is one finding that is very consistent across the developmental studies. Regardless of the language they were learning, the children studied used definite expressions in their language to *maintain* known referents more often, at an earlier age, or at levels more comparable to adults, than they used indefinite expressions to *introduce* new referents. As stated earlier, presupposition skill has two aspects. It seems easier for children to presuppose that the listener has knowledge of a known referent than it

is for them to presuppose that the listener does not have knowledge of a new referent. This clear developmental difference between different types of referential function invites us to think further about their cognitive demands. A second goal of the present study is to collect further observations about the influence of referential function on children's ability to make adequate reference.

Before I discuss presupposition from a theoretical perspective in the next section, I will review a set of studies which also report age differences in the use of referring expressions. In these studies, the development of reference is examined in terms of form-function relations between referring expressions and narrative coherence. Referring expressions, particularly pronouns, are examined as cohesive devices for creating an overall textual structure of connected discourse. Narrative coherence is not the focus of the present study, but since the relations of referring expressions and presupposition will be examined in the context of short narratives, this body of work is briefly reviewed here.

Hickmann (1980) examined how adults and school-age children used referring expressions to create referents for subsequent intralinguistic cohesive relations in narratives. Without the support of props or pictures, these adults and children aged 7 and 10 years, were asked to narrate short films from memory to listeners who had no prior viewing of the films. Only the adults and 10-year-olds used the appropriate referring expressions, primarily indefinite articles, more than other inappropriate forms for first mention of referents. Animacy of the referents was found to affect the 7-year-olds' use of appropriate forms for introduction. The 7-year-olds were able to use indefinite articles appropriately to introduce inanimate referents, but failed to do so when introducing animate referents. Hickmann's analysis of a few narratives from 4-year-olds revealed a complete absence of the use of indefinite articles to introduce even inanimate referents. Hickmann

concluded from these findings that 7 was the age when children began to connect their utterances to create a coherent narrative.

However, referent introduction itself alone provided partial if not weak evidence of children's ability to establish narrative coherence. Karmiloff-Smith (1981) examined narrative coherence in children through their use of pronouns for reference to different story characters in subsequent as well as first mentions. In this study, each of the 170 English- and French-speaking children, aged 4 to 9, was presented with books containing six pictures each, and was asked to tell the experimenter what was happening in each story book. The four types of stories involved different numbers of characters and the characters differed in their thematic importance in each story type. For example, in one story type, there were two characters. One of them was the main protagonist, who was involved in the major event of the story and present in all of the pictures. The other minor character was present only in a few of the pictures. In another story type, there was no clear distinction between main and minor characters. Both characters remained together from the first to the last picture in almost all events.

Children under 6 years of age were found to use paralinguistic gestures (e.g., pointing to a character on the page of a picture book) to accompany their use of pronouns for subsequent reference to story characters. This use of pronouns was viewed as being deictic in nature because their interpretation had to be based on shared knowledge of the nonlinguistic context with the experimenter. With the absence of propositional links that could be made possible by the anaphoric use of pronouns, their stories lack coherence. These children described each picture as a separate entity, without creating a coherent narrative from the sequential pictures.

Children at 6 years showed a pattern of use of pronouns that Karmiloff-Smith called the "thematic subject" strategy. They were found to reserve the use of pronouns for the thematic subject, or main protagonist, of the story in the utterance-initial position, while full nominal expressions were used for reference to other characters, almost exclusively in nonsubject positions. By doing so, they made attempts to indicate that their sentences were related and to impose a coherent structure onto their narratives. The thematic subject strategy was considered a means by which children referred to characters of different thematic importance in different ways in order to establish narrative coherence.

Using a similar design, Bamberg (1987) examined the use of pronominal anaphora in the narratives of German speaking adults and children between the ages of 3;6 and 10;1. A 24-page wordless picture book, Mercer Mayer's *Frog, Where are you?* (1969) was used to elicit the narratives. The two main protagonists, the boy and the dog, were involved in a number of different actions together, or separately with a host of other minor characters, hence providing many opportunities for the examination of how German-speaking adults and children used pronominal reference to create narrative coherence. Bamberg (1987) confirmed that the use of thematic subject strategy for narrative coherence was a developmental strategy used only by younger language learners, but not by adults. Adult speakers used an anaphoric strategy, in which the appropriate pronominal forms were used consistently for referent maintenance and the appropriate nominal forms for referent switch, regardless of the thematic importance of the characters. This adult pattern was first seen in children 9 years of age. This was consistent with the data reported in Karmiloff-Smith (1981).

Karmiloff-Smith (1981) and Bamberg (1987), however, reported different ages at which the thematic subject strategy emerged. In their stories, German-speaking children at 3;6 were found to show a strong preference to use pronominal forms to switch reference to

the boy while using nominal forms to switch reference to the dog. This early use of the thematic subject strategy was also replicated in a subsequent study of English-speaking 3-year-old children using the same picture book (Gomme & Johnson, 1997). Bamberg (1987) argued that the 3-year-olds' use of pronouns was not deictic as was argued by Karmiloff-Smith (1981), because their use was differential, for referent switch primarily only to the boy but not the dog. When comparing the frequency of pointing that accompanied nouns with that of pronouns for their 3-year-olds, Gomme and Johnson (1997) found no significant differences, and hence also concluded that the 3-year-olds' use of pronouns was not deictic in nature.

In the studies reviewed, it can be concluded that, at least in longer stories, where there were more opportunities for reference, children made attempts to establish narrative coherence through their differential use of pronouns depending on the thematic importance of the characters. In these studies, children were asked to tell stories to the examiner who was viewing the picture book(s) with them. Even though the use of referring expressions in these children's stories does not allow us to infer whether they made appropriate presuppositions about their listener's knowledge, it allows us to see how children organize their narratives as a coherent whole, which is important for successful communication in its own right. Relevant to the current study, it also shows us that discourse genre affects children's use of referring expressions.

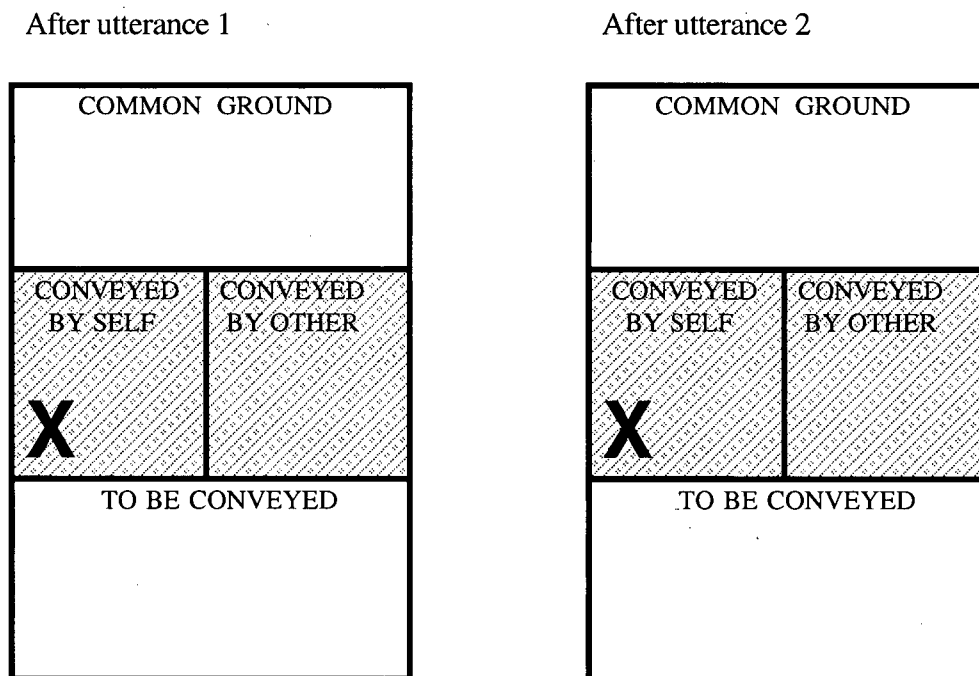
1.6.1. Presupposition for reference: Theoretical discussion of possible developmental variables

Review of the relevant empirical literature identifies two possible discourse determinants of developmental differences in presuppositional skill for reference: type of referential function and discourse position. In this section, I will discuss how a theoretical

understanding of presupposition as cognitive process, as discussed in Section 4.3., might explain these differences. For simplicity of description, I will make use of a situation in which the speaker only intends to talk about two entities and only refers to one entity in each utterance.

Fig. 1.5 illustrates the speakers' discourse representation after utterance 1 and his new discourse representation if he successfully Maintains reference to X in utterance 2. *Maintenance* is the referential function in which the speaker continues to refer to the same entity X from one utterance to the next. After each utterance, the speaker updates his representation of the discourse to reflect the changes in the listener's knowledge and attentional focus regarding entity X. In fact, after utterance 1, no change is needed. When maintaining entity X in his next immediate utterance, the speaker consults his discourse

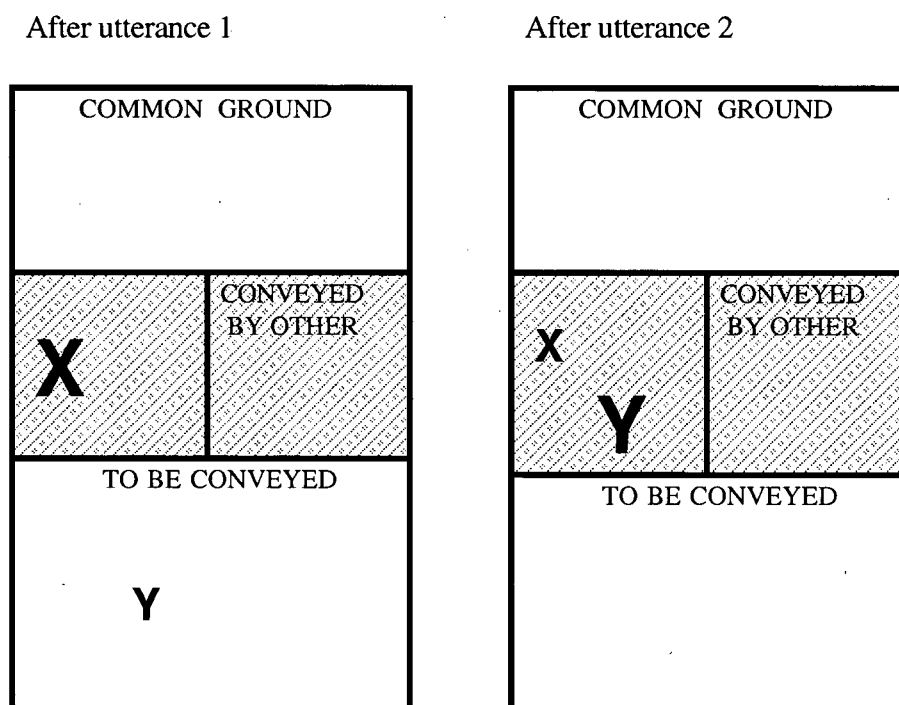
FIG. 1.5. An illustration of the speakers' discourse representation after utterance 1 and his new discourse representation if he successfully Maintains reference of X in utterance 2.



representation, and makes a presupposition that the listener already knows the entity and is currently also attending to it. Based on this presupposition, he chooses a referring expression that will signal to the listener that the entity is known, and is the same entity as the one referred to in the last utterance.

Fig. 1.6 illustrates the speakers' discourse representation after utterance 1 and his new discourse representation if he successfully Introduces Y in utterance 2. *Introduction* is the referential function in which the speaker refers to an entity for the first time. After utterance 1, the speaker updates his representation of the discourse to reflect the changes in the listener's knowledge and attentional focus regarding entity X. He now intends to introduce entity Y in his next utterance, and so consults his discourse representation. There he finds that entity Y is not yet in the discourse model, but is in the knowledge-the-speaker-intends-to-convey component. He makes a presupposition that the

FIG. 1.6. An illustration of the speakers' discourse representation after utterance 1 and his new discourse representation if he successfully Introduces Y in utterance 2.

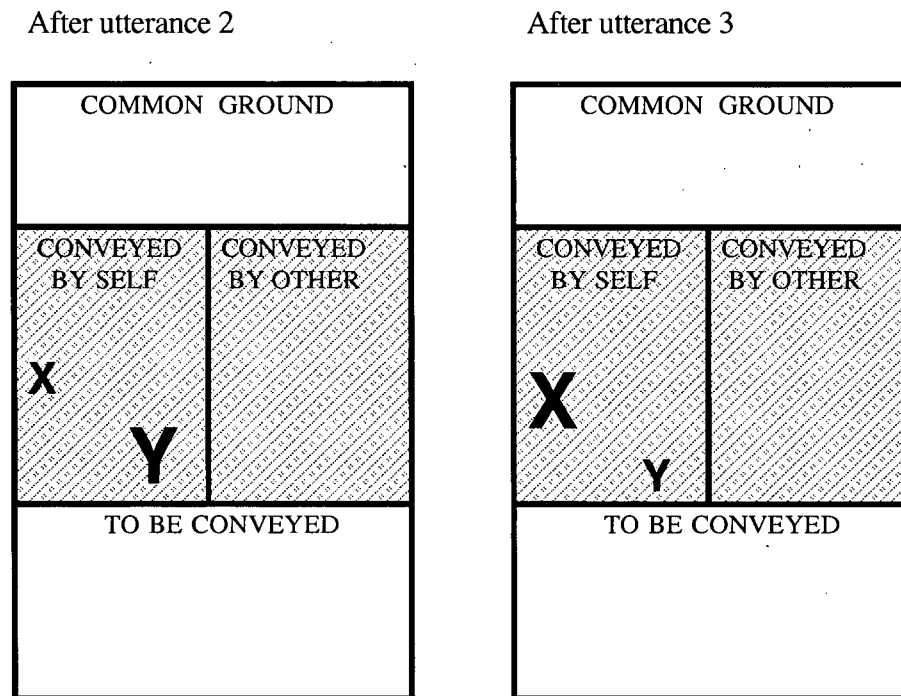


speaker does not yet know entity Y, and based on this presupposition, he chooses a referring expression that will signal to the listener that the entity is new and therefore, different from one in the last utterance.

Continuing the example illustrated in Fig. 1.6, Fig. 1.7 illustrates the speakers' discourse representation after utterance 2 and his new discourse representation if he successfully Reintroduces X in utterance 3. *Reintroduction* is the referential function in which the speaker refers to entity X again after he has talked about entity Y in an intervening utterance(s). After utterance 2, the speaker updates his representation of the discourse to reflect the changes in the listener's knowledge and attentional focus regarding entity Y, and entity X as well. Entity Y is in the discourse model and in the listener's attention focus as a result of its mention in the last immediate utterance. Entity X remains in the discourse model but is no longer in the listener's attention focus because it has not been mentioned in the previous utterance(s). When reintroducing entity X in his next utterance, the speaker consults his discourse representation and finds reduced attentional states in X relative to Y. He makes the presupposition that entity X is less known to the listener now, and based on this presupposition, he chooses a referring expression that will signal to the listener that the entity is known from earlier in the discourse but is different from one in the last utterance.

This understanding of the functions could provide an explanation for function differences if these differences were to be found. For example, it can be argued that Reintroduction involves relative judgment of attentional focus that is qualitatively different from the simpler judgment of presence or absence that is required by the Introduction function.

FIG. 1.7. An illustration of the speakers' discourse representation after utterance 2 and his new discourse representation if he successfully Reintroduces X in utterance 3.



There is a similar possibility for explaining discourse position differences. For example, it can be argued that as the discourse evolves, representations of entities and their relations, and of properties of entities, increase. Maintenance of these representations takes up cognitive resources, hence leaving the child increasingly vulnerable to error in reference later in the discourse.

From the developmental literature on the contrastive use of referring expressions in stories, it is found that young children between mid-4 to 5 years of age are able to make presuppositions about their listener's knowledge. Discourse positions and types of referential function are identified as plausible factors on children's presupposition skills. Children's ability to make adequate reference to story characters requires knowledge of language forms, as well as presupposition skills. In this section, we will examine the

different types of referring expressions in Cantonese and the development of these expressions in Cantonese-speaking children.

1.7. THE DEVELOPMENT OF CANTONESE CHINESE REFERRING EXPRESSIONS

This section begins with a brief introduction to the structure of the Cantonese Chinese pronoun, noun phrase, and sentence. A description of how referring expressions and word order are used for signaling given and new referents in adult speakers will follow.

1.7.1. The structure of the Cantonese Chinese pronoun, noun, and sentence

In Cantonese nouns, there are no inflectional or derivational morphemes for marking number, gender, or case role, and Cantonese nouns can occur without any modifiers at all, i.e., as 'bare' nouns. Nouns can also be modified by a combination of demonstrative determiners, numeral determiners, classifiers, and adjectives, resulting in a number of different lexical noun phrases. In a lexical noun phrase, when a demonstrative or a numeral is used, a classifier obligatorily precedes the noun. A relative clause can also modify a noun, and such clauses, like all modifiers, precede the noun.

Here is how the various lexical modifiers are ordered in a Cantonese noun phrase: Lexical noun phrase: demonstrative-numeral-classifier-adjective-noun. The following examples illustrate different types of Cantonese noun phrases:

bare noun: *naam4 zai2*

boy

Classifier NP: classifier + noun

go3 naam4 zai2

CL boy

‘(a) boy’

Numeral NP: num. + CL + (adj) + noun

jat1 go3 (hou2) naam4 zai2

one CL (nice) boy

‘one (nice) boy’

Demonstrative NP: dem. + (num.)+ CL + (adj) + nouns

go2 (jat1) go3 (hou2) naam4 zai2

that (one) CL (nice) boy

‘that (nice) boy’

Relative NP: relative clause + L-P/ classifier + noun

sik6 gan2 je5 go3 naam4 zai2

eat ASP thing CL boy

‘the boy who is eating’

Cantonese has personal pronouns, demonstrative pronouns, and zero pronouns (ellipsis). Cantonese personal pronouns have no gender marking or overt case marking. The same pronoun is used for both masculine and feminine individuals and for subject and object case roles. The postposed morpheme *deih* is added to a pronoun to indicate plurality. Contexts often determine case in Cantonese, as in Mandarin (Erbaugh, 1992). The personal pronouns are: *ngo5* ‘I’, *nei5* ‘you’, *keoi5* ‘s/he, it’ and the demonstrative pronouns are *nei1*, *go2* ‘this, that’. A personal pronoun or noun can combine with the

head noun to form a possessive noun phrase. The linking particle *ge3* or classifier is optional when the noun phrase refers to personal relationships.

Possessive NP: personal pronoun / noun + (L-Pge"/classifier) + noun

ngo5 (go3) maalmi4

I (CL) mother

'my mother'

mei5 jin3 gin6 laul

Mei Yin CL jacket

'Mei Yin's jacket'

Like Mandarin, the basic unmarked word order in Cantonese is SVO, i.e., subject-verb-object. But Chinese word order is quite variable (Li, Bates, & MacWhinney, 1993) and Matthews and Yip (1994) suggest that Cantonese has rather greater freedom in word order than English. Deviations from the basic word order include patterns such as: (a) VS, which involves mostly ergative verbs, (b) dislocation of the subject noun or pronoun to the end of a sentence in colloquial speech (right dislocation), and (c) topicalization of various elements in the sentence by moving them to the beginning of a sentence, resulting in SOV or O(S)V word order.

1.7.2. Referring expressions for marking given and new referents

Like English, Cantonese uses different forms of referring expressions for marking the given and new pragmatic distinction in discourse, including the different noun phrases, lexical and zero pronouns. Lexical and zero pronouns function as definite referring expressions used for marking known referents. Some noun phrases also function as

definite expressions, others as indefinite, depending on their internal structure. Unlike English, these noun phrases are not contrasted by determiners such as definite and indefinite articles. Numeral NPs can mark new referents, whereas Demonstrative NPs and Relative NPs can mark known referents. Classifier NPs and bare nouns can mark either new or known referents, as will be later described.

There has been no systematic study of the type(s) of referring expressions used for each of the different information statuses (Brown & Yule, 1983) or cognitive status (Gundel et al., 1993) in Cantonese. Gundel, Hedberg, and Zacharski (1993) presented evidence that Mandarin shows the same hierarchical relationship between cognitive status and referring expressions, as in French, German and English. For example, zero forms are used to denote entities that the listener knows and is currently attending to and Numeral NPs are used to denote entities that the listener does not know. Given that the grammatical structure of Mandarin and Cantonese Chinese are similar in most aspects (Matthews & Yip, 1994), it is possible that Cantonese referring expressions correspond to cognitive status, and hence information status, in very similar ways (see Table 1.2).

In English, the marking of the given and new distinction is primarily by means of NP types. In Mandarin Chinese, in addition to NP types, word order is also involved. It has been observed that the preverbal position is reserved for definite expressions, and hence that indefinite expressions cannot be placed in the preverbal position (Chao, 1968; Li & Thompson, 1981; Zhu, 1982). Hickmann and Liang (1990) confirmed that Mandarin adult speakers marked the given and new distinction maximally, using definite expressions in the preverbal position for marking known referents and indefinite expressions in the postverbal position for marking new referents. Again, given that the grammatical structure of Mandarin and Cantonese Chinese are similar in most aspects (Matthews & Yip, 1994), it is assumed that the given and new distinction is also marked by a combination of word

order and NP types in Cantonese (Lee & Szeto, 1996) In Cantonese, a classifier NP or bare noun can function as a definite or an indefinite referring expression, and whether it marks a new or a known referent depends on its position relative to the verb.

In Cantonese Chinese, as in Mandarin Chinese, there is one common construction for introducing new referents. Given that the preverbal position is reserved for definite referring expressions marking known referents, an indefinite numeral NP cannot be placed in the preverbal subject position as in *jat1 go3 naam4zai2 fan3 gan2 gaau3* (one CL boy ASP sleep, 'a boy is sleeping'). With the use of the existential verb *yauh* before the numeral, an existential presentative construction puts the indefinite Numeral NP in the postverbal position, therefore allowing it to be used to signal a new referent (for Mandarin, see Chao, 1968; Li & Thompson, 1981). Here is an example of such an existential presentative noun phrase:

jau3 jat1 go3 naam3zai1 fan3 gan2 gaau3

have one CL boy ASP sleep

'A boy is sleeping'

1.7.3. The development of Cantonese Chinese referring expressions

Little was known about the development of Cantonese in young children until some fifteen years ago. Results of the first research efforts are summarized and discussed by Lee (1996). Additionally in the past five years, there were two major reports on language development in Cantonese-speaking children, one based on longitudinal data from a small group of children (Lee et al., 1996) and the other based on the same longitudinal data as well as a larger sample of cross-sectional observations (Fletcher, Leung, Stokes, &

Weizman, 2000). In the following, I summarize the development of noun phrases as described in these reports.

Wong (1996) examined Cantonese-speaking children's development of the noun phrase structure. Four children were followed for a year, with ages at Time 1 from 1;5 to 1;11 and Time 2 from 2;7 to 2;10. They were found to show the same developmental pattern in use of nominal categories. They used bare nouns first, followed by noun phrases involving classifiers, and then pronouns. Noun phrases used by these children around two years of age were predominantly two elements in length and mostly classifier related.

In a study of 180 Cantonese-speaking children equally divided between the ages of 3, 4 and 5 years, Tse-Luk (1992) reported that the pronouns *ngo5* 'I' and *nei 5* 'you' are acquired at 3 years and the pronoun *keoi5* 'he/she' is acquired at the age of 4. Results were based on the analysis of spontaneous language samples collected during free play. In this study, acquisition was defined as the age at which 75% of the children used the pronominal form examined, regardless of frequency of use or syntactic, semantic and pragmatic accuracy.

Based on longitudinal conversational samples of 8 children and cross-sectional conversational samples of 70 children, Fletcher et al. (2000) reported that, regardless of clause position, bare nouns and pronouns were first seen in the 2-year-olds' speech, whereas Demonstrative NPs, Numeral NPs, and Classifier NPs emerged in the 3-year-olds'. The different types of possessive NPs, including pronoun+Genitive+noun, noun+genitive+noun and pronoun+noun were not seen until 5 years of age. This study did not examine the emergence of relative NPs and existential expressions. For Mandarin-speaking children, the existential expression for first mention was used by young children

as early as between 2;6 to 3;6 (Min, 1994). However, they were used only in some contexts, mainly to introduce referents at the beginning of narratives.

To summarize, by 3 years of age, Cantonese-speaking children evidence knowledge of the indefinite referring expression (i.e., Numeral NP), definite referring expressions (i.e., Demonstrative NP) and pronouns, as well as bare nouns and Classifier NPs. Possessive constructions are not seen until 5 years of age. These data show that at age 3, Cantonese-speaking children have at least some noun phrase types available for them to attempt to make clear reference in discourse. However, compared to the 5-year-olds, they are more limited in the choice of referring expressions.

1.8. CHILDREN WITH SPECIFIC LANGUAGE IMPAIRMENT

One of the original motives for this study was the possibility that Cantonese-speaking children with SLI would have particular difficulty in making adequate reference. In this section, I briefly review the literature and discuss the hypotheses about the nature of SLI that lead to this possibility.

Specific language impairment has been most extensively studied in English-speaking children. There is not a language domain that has been reported to be problem free for these children (Bishop, 1992; Johnston, 1988; Leonard, 1998). However, grammatical morphology is the domain that has most consistently been found to be difficult. Hence children with SLI demonstrate a pattern of protracted development (Johnston & Schery, 1976) and reduced use (Steckol & Leonard, 1979) of a majority of grammatical morphemes. Two families of explanatory accounts have been proposed to explain the linguistic deficits in children with SLI: representational deficits and processing deficits. The representational deficit accounts attribute children's language deficits to

specific 'missing' features in the grammar. Gopnik's (1990) feature deficit account and Rice, Wexler, & Cleave's (1995) period of extended optional infinitive account are two such proposals. The processing deficit accounts attribute children's language deficits to general processing difficulties in attentional or memory mechanisms. These processing limitations slow the learning process and create continuing problems with the use of forms once they are learned. For example, Leonard, McGregor, and Allen (1992b) argue that the poor perception and processing of phonetically less salient elements explains the vulnerability of grammatical morphemes and Bishop (1994) argues that later inconsistent use of grammatical morphemes likewise reflects processing limitations.

In recent years, studies of children with SLI have extended to other languages. The purpose of the crosslinguistic work is not just to increase our understanding of the nature of SLI as a universal phenomenon, but also to evaluate the two explanatory accounts. From the perspective of the representational accounts we might expect to find broad similarities in the manifestations of SLI across languages. From the perspective of the processing accounts we might expect to find language-specific manifestations, because the same sort of processing limitations could lead to different learning outcomes, depending upon the structure of the language.

Thus far, the crosslinguistic work seems to support the processing accounts. Leonard, Bortolini, Caselli, and McGregor (1992a) and Bortolini, Caselli, and Leonard (1997) for example, report that, as predicted, inflectional morphemes are generally not forms of particular difficulty for Italian-speaking children with SLI. In Italian, unlike in English, most inflectional morphemes are phonetically salient. Cantonese Chinese, however, does not have inflectional morphemes. Hypotheses related to inflectional morphemes cannot be evaluated on Cantonese-speaking children with SLI.

A unique feature of Cantonese is its topic-comment typology, and hence topic chains are common (Matthews & Yip, 1994). In such a series of connected sentences, the topic of the first clause can be the subject or the object of the subsequent sentences, and these subject and object noun phrases or pronouns are often omitted when they can be inferred from the physical context or the discourse. While Cantonese grammar allows optionality of noun phrases and pronouns in sentences, subject noun phrases or pronouns are almost always required in English, and when these noun phrases denote singular and countable entities, the use of a definite or indefinite article is obligatory. It is plausible that for a Cantonese speaker, decisions about whether or not to use an explicit noun phrase or pronoun to refer to an entity in an utterance, rely not so much on sentence-level syntax, as on pragmatic and discourse variables. These variables involve cognitive processing of the listener's knowledge across large units of language and meanings, and across both linguistic and physical contexts at the same time. As English-speaking children with SLI demonstrate cognitive processing deficits in both linguistic (e.g., Masterson & Kamhi, 1992) as well as nonlinguistic tasks (e.g., Ellis Weismer, 1991), it is plausible that Cantonese-speaking children with SLI, presumably sharing the same processing deficits, demonstrate particular difficulties in the learning and use of noun phrases and pronouns for adequate reference in discourse.

This study examines the development of reference in discourse by Cantonese-speaking children with SLI. These children's performance will be compared with that by children matched for age as well as language level. Results will indicate whether reference is a particular area of difficulty for Cantonese-speaking children with SLI.

1.8.1. English-speaking children with specific language impairment and their development of referring expressions

There have been numerous reports on problems English-speaking children with SLI have with pronouns, as early as in the first studies of the population (Lee, 1966; Menyuk, 1964). However, pronouns were examined primarily as morphosyntactic forms (Johnston & Kamhi, 1984; Leonard, 1982; Loeb & Leonard, 1988; Loeb & Leonard, 1991) or cohesive markers in narratives (Liles, 1985a; 1985b; 1993). From the morphosyntactic perspective, children with SLI were found to use the object case in the subject position more frequently than normally developing children at any stage of development (e.g. Loeb & Leonard, 1991). From a cohesion perspective, Liles (1985a) found that the twenty English-speaking children with SLI aged 7;6 to 10;6 years used a significantly lower percentage of personal pronouns and a significantly higher percentage of demonstrative pronouns and lexical ties in their stories than their age-matched typically developing peers. Liles, Duffy, Merritt, & Purcell (1995) also reported similar findings. Different results, however, were reported in Johnson and Ruthven (1998). Following Halliday and Hasan's (1976) framework, Johnson and Ruthven included and analyzed repetition as a subtype of lexical ties. The six English-speaking children with SLI, aged 9;1 to 11;8 years, used fewer lexical ties than the six typically developing peers with normal language development. The two groups of children used personal and demonstrative pronouns as referential cohesive ties at similar levels.

There is only one study, however, which examined English-speaking with SLI's use of pronouns relative to other referring expressions in narratives (van der Lely, 1997). In this particular study, nominal (definite or indefinite article + noun) and pronominal (pronouns and zero anaphors) expressions were examined in relation to the information

status of the referents. The research question concerned the linguistic devices used to signal the three different information statuses, i.e. (a) new/first introduced/mentioned referents, (b) old/maintained referents, that is, ones that were the same as the one that had just been talked about, or (c) interrupted and now reintroduced referents. Thirty-six typically developing and twelve children with SLI were asked to tell a story to a blindfolded listener. The children with SLI were carefully selected for their persistent and disproportionate difficulties in morpho-grammatical abilities. These children, aged 10;2 to 13;11, used more nominal expressions to re-introduce the referents than did the three younger normal language control groups, aged 6;4 to 9;8. However, all of the groups used more pronominals than nominals to maintain reference. And, like the three controls, most of the grammatical ESLI used nominal expressions with the indefinite article to introduce the two referents of interest in their narratives. Given this contrastive pattern of language use for information status marking, it was concluded that linguistic expressions involved in pragmatic function marking were not disproportionately difficult for this subgroup of children with SLI, in comparison to younger typically developing children at the same level of morpho-grammatical abilities, or vocabulary comprehension and production.

Evidence from van der Lely (1997) seemed to show that at least one subgroup of school-age English-speaking children with SLI (ESLI) are able to make presuppositions of listener knowledge that were comparable to those of typically developing children at the same language level. However, as these children in van der Lely (1997)'s study were pre-adolescents at quite advanced language levels, where group differences in learning patterns may no longer be visible, it remains possible that they might have had an early history of presuppositional difficulties. Support for this possibility comes from studies showing that while the condition of SLI persists, its manifestations change with age (Scarborough, 1985). In perhaps the clearest example, children with SLI who managed to reach comparable levels on spoken language measures at the end of their preschool years were

often found later to demonstrate reading difficulties (Bishop & Adams, 1990; Scarborough & Dobrich, 1990; Tallal, Curtiss, & Kaplan, 1988).

Given the limited research available, there is as yet no clear picture of the distributional pattern of referring expressions for marking information or cognitive status in the language of ESLI children. For those who are committed to general processing accounts of SLI, the processing demands of maintaining an adequate discourse representation would seem to predict that the presuppositional abilities of children of SLI would fall behind those of their age peers, if not their language peers, but this has yet to be demonstrated.

1.8.2. Cantonese-speaking children with specific language impairment and their development of referring expressions

Research on Cantonese-speaking children with SLI (CSLI) is just at its infancy, and there have been no studies of their development of referring expressions. The only relevant published study concerns their development of noun classifiers. Cantonese-speaking children with SLI and their age controls were found to be comparable in the overall accuracy of use of the nine sortal classifiers examined in an object naming task (Stokes & So, 1997). However, the error patterns were different between the groups, with the SLI group making significantly more omission errors. Moreover, substantial individual variation was noted for both groups in the quantitative measure as well as the qualitative analysis of error patterns. Given the lack of a comparison group at similar language levels, it remains unclear whether classifiers are a disproportionate area of deficit for Cantonese-speaking children with SLI.

1.9. SUMMARY AND RESEARCH QUESTIONS

As we have seen, learning how to use referring expressions is not an easy task. It does not involve only the mastery of forms and meanings. To communicate successfully and efficiently with the use of referring expressions, the speaker needs to constantly make presuppositions about the listener's knowledge about the character to be referred to at each moment in discourse. In this project, I take a pragmatic and cognitive approach in the examination of the development of these abilities in typically developing Cantonese-speaking children and Cantonese-speaking children with specific language impairment. Type of referential function and discourse position will be manipulated in an attempt to explain developmental differences and differences between typical and atypical children.

In particular, this study attempts to answer the following research questions:

1. At what age do Cantonese-speaking children refer adequately to the different characters they are talking about in their stories?

Based on the literature reviewed, it is predicted that Cantonese-speaking children will refer adequately to different characters around the age of five.

2. Do Cantonese-speaking children succeed with certain referential functions at earlier ages than others?

It is predicted that Cantonese-speaking children will succeed first with Maintenance, then with Introduction, and last with Reintroduction. These functions involve presuppositional processes with different levels of cognitive complexity.

3. Do Cantonese-speaking children refer to story characters at different points in the discourse with equal clarity?

It is predicted that Cantonese-speaking children will refer to characters more clearly early rather than late in the discourse. Competition for processing resources among the accumulating representations as the discourse proceeds should result in more error in making presuppositions, and hence less adequate reference.

4. Which referring expressions do Cantonese-speaking children use for specific referential functions?

Based on literature reviewed, it is predicted that when they refer adequately, Cantonese-speaking children will use different forms for different referential functions.

5. Do Cantonese-speaking children with SLI show particular difficulty in the mastery of referential functions?

It is predicted that given a general processing deficit, Cantonese-speaking children with SLI will demonstrate difficulty in the mastery of referential functions in discourse. To succeed with these functions would entail cognitive processing of multiple information across large units of language and meanings, which could require more processing resources than are available.

CHAPTER TWO

METHOD

To address the questions stated at the end of Chapter One, an experimental story-telling task was given to Cantonese-speaking children, with and without specific language impairment, to examine how well they could refer adequately to different story characters. Three supplementary tasks were also given to examine their knowledge of referring expressions needed for success in reference.

In this chapter, I describe the children who participated in the study and their groupings. Materials and procedures for the experimental story-telling task and the judgment and scoring of referential adequacy are detailed, and I conclude with information about the supplementary tasks and their marking guidelines.

2.1. PARTICIPANTS

Fifty Cantonese-speaking children with typical development and eight Cantonese-speaking children with SLI participated in the study. The typically developing children were from five age groups: 3, 4, 5, 7 and 12 years. The children with SLI were 5 years of age. All children were learning Cantonese Chinese as their first language. To aid in subject selection and grouping, all of the typically developing 3-, 4- and 5-year-old children as well as children in the SLI group, received a general test of their language abilities, the Hong Kong Cantonese version of *The Reynell Developmental Language Scale* (Reynell & Huntley, 1985; The Committee on Standardization of the Hong Kong version, 1987; hereafter the Reynell). Children with SLI and all typically developing children, except the 12-year-olds, also received a test of their nonverbal cognitive abilities, *The Columbia Mental Maturity Scale* (Burgemeister, Blum, & Lorge, 1972; hereafter the CMMS).

The Reynell is the only standardized assessment tool that examines the ability of Hong Kong children, between the ages of 1;0 and 6;11, to understand and express themselves in Cantonese. For the receptive language scale, the child is asked to point to an object or manipulate small toys. For the expressive language scale, the child is asked to label objects, give definitions, and describe pictures. The Reynell gives a separate standard score for receptive language and expressive language, and for each of the components that make up the expressive language score, including vocabulary, syntax and content.

Currently there are no standardized tests of nonverbal cognitive abilities for Cantonese-speaking children 3 to 6 years of age. The CMMS, standardized for North American children between the ages of 3;6 and 9;11, was chosen because it is used often in research on 5-year-old children with SLI, and only minimal and simple verbal instructions are required. The instructions were translated into colloquial Cantonese Chinese, at a level that young children could understand. For each item, there are four or five line drawings, and the child is asked to "Point to the picture that does not belong to the others" or to "Show me the picture that is different." Due to the absence of norms from Hong Kong Cantonese-speaking children, the North American norms for the CMMS were borrowed for use as a consistent though somewhat arbitrary reference point.

2.1.1. Children with typical development

The fifty children with typical development were recruited from nurseries, kindergartens, and primary schools in Hong Kong. Children in the 4-year-old and the 12-year-old groups were recruited from one school, and those in the 3-, 5- and 7-year old groups were recruited from three different schools in two different parts of the city. All of the 3-, 4- and 5-year-old children demonstrated age-appropriate language comprehension and production abilities, defined as receiving scores no lower than 1.5 standard deviations

below the mean score for their age on the Reynell. All of the 3-, 4-, 5-, and 7-year-old children received a pass on nonverbal cognitive abilities, with 'pass' defined as no lower than 1.5 standard deviations below the mean score on the CMMS as normed for North American children of the same age. The 7- and 12-year-old children did not receive a formal language test; nor did the 12-year-old receive a formal test of their nonverbal cognitive abilities because they were older than the normative samples for the Reynell and the CMMS. However, they, as well as the younger children with typical development in this study, showed average abilities in class, and had no documented history of speech, language, or learning problems, or hearing or psychosocial difficulties, as reported by their classroom teachers.

2.1.2. Developmental groupings

To establish typical developmental patterns for referential adequacy, and to identify developmental changes in the expressions used to achieve adequacy, 47 of the typically developing children were divided into four age groups: the 3-, 5-, 7- and 12-year-olds. An additional three 4-year-olds were not included in these age-based groups, but were included in the matching with the SLI children to be described in the next section. Of the 47 children, four were eventually excluded from data analysis. Three of the 3-year-olds refused to participate in the experimental story-telling task, and one 5-year-old gave incomplete data due to technical difficulties with the tape recorder. This left 43 children in the four developmental groups: 3-year-olds (range: 40 - 46 months), 5-year-olds (61- 71 months), 7-year-olds (86 - 94 months) and 12-year-olds (129 - 157 months). Each age group had approximately equal number of boys and girls. Table 2.1 shows the mean (and standard deviation) scores on the cognitive and language tests for these children.

TABLE 2.1

Mean (and Standard Deviation) Scores on the Cognitive and Language Tests by Age Groups

Age group in years	N	Age in months	CMMS ^a	Reynell-R ^b		Reynell-E ^c	
				Raw	Standard	Raw	Standard
				Scores	Scores	Scores	Scores
3	10	43.6 (1.9)	112.1 (8.1)	50.8 (4.2)	+1.0 (0.7)	53.7 (5.4)	+0.8 (0.8)
5	13	65 (3.1)	119.4 (10.1)	61.6 (3.2)	+ 1.1 (0.7)	65.5 (4.2)	+1.0 (0.7)
7	12	90.4 (2.7)	109.1 (9.1)	n/a		n/a	
12	8	142.8 (11.3)	n/a	n/a		n/a	

a. CMMS = Columbia Mental Maturity Scale in standard scores with mean = 100, standard deviation = 16. b. Reynell-R = Reynell Developmental Language Scale-Receptive scale.

c. Reynell-E = Reynell Developmental Language Scale-Expressive scale.

2.1.3. Children with specific language impairment

Eight children with SLI, age ranged from 5;0 to 6;0, were included in this study. This age group of children with SLI were selected because they were just old enough to have some exposure to storytelling activities, but also old enough to be given the Reynell. In Chapter One, typically developing children between mid-4 to 5 years were found to demonstrate this ability. Seven of the children were part of a larger participant pool in a

longitudinal project conducted at the University of Hong Kong, and the eighth was referred by a speech language pathologist from a community hospital in Hong Kong. The seven children from the longitudinal project were first recruited 10 to 14 months prior to this study. At that time, five of them were below age levels on both the receptive and the expressive scales on the Reynell. The remaining two children were below age level only on the expressive scale. Six out of the seven children did not reach the 90% pass criterion on the Cantonese Segmental Phonology Test (So, 1993), a test of their production of Cantonese speech sounds. According to reports from their parents and speech language pathologists, these seven children demonstrated no atypical psychosocial behaviors, hearing difficulties, or developmental problems other than in speech and language. The one child referred by the community speech language pathologist was first diagnosed as language delayed at 2;10. The Reynell was given but not completed and, hence, the scores are not available. The speech language pathologist reported no concerns with his hearing, general cognitive, or psychosocial⁵ abilities.

All of the eight children had received therapy for their language difficulties, provided at various frequencies, in speech therapy clinics close to their homes, prior to this study. At the time of this study, four of the eight children were found to be at age-appropriate levels on the Reynell, both the receptive and expressive scales. Three of the four remaining children were still below age level on the receptive scale. Only one child remained below age level on both the receptive and the expressive scales. This child was eventually removed from the study because he refused to participate in the experimental story-telling task. All of the remaining seven children with SLI passed a hearing screening within a month of this study and scored no less than 1.5 standard deviations below the mean on their nonverbal cognitive skills, as measured by CMMS, again using the North

⁵ According to the child's mother, however, the child had received sensory integration therapy and his occupation therapist once pointed out that he had some 'autism tendencies'.

American norms. Table 2.2 lists the standard deviation scores for these children with SLI on the Reynell-Receptive and Reynell-Expressive scales before, and at the time of, this study.

TABLE 2.2

Standard Deviation Scores on the Reynell by each child in the SLI Group Before, and at the time of the Study

Child	Reynell-R ^a prior	Reynell-R current	Reynell-E ^b prior	Reynell-E current
1	-1.0	-0.6	-1.8	+0.2
2 ^c	<-3.4	-3.1	<-3.5	-2.5
3	<-2.5	<-2.5	<-2.0	-0.1
4	-0.8	-0.2	-1.5	+0.3
5	<-3.4	<-3.5	<-1.6	-1.3
6	-3.0	-1.2	-1.5	-0.7
7	<-3.4	-1.6	<-2.7	+0.2
8	not available	+0.5	not available	+0.3

a. Reynell-R =Reynell Developmental Language Scale-Receptive scale. b. Reynell-E = Reynell Developmental Language Scale-Expressive scale. c. Child # 2 was removed from the study.

2.1.4. Matched comparison groupings

In order to compare the children with SLI with their age peers, and with typically developing children at the same language level, two matched groups of children were selected from among the 3-, 4- and 5-year-old children described in the last section.

Children in the age-matched group were selected from the larger pool of 13 children based on age, the 5-year-old with the closest age being matched to each child with SLI. In the one case where there were two possible matches for the same child, selection was made by blind draw. There were four boys and three girls in the age-matched group.

The seven children in the language-matched group were selected according to language criteria. The 3- or 4-year-old child with the closest raw score on the Reynell *expressive* scale was matched to each child in the SLI group. The expressive score was used as the matching variable because I was comparing performance on a production task. In the one case where there were three possible matches for the same child, selection was again by blind draw. There were five boys and two girls in the language-matched group. Table 2.3 provides mean (and standard deviation) scores for cognitive and language tests for the SLI children and the two control groups.

As can be seen, the SLI and control groups were well matched. The SLI group and the 5-year-old group were virtually identical in age and both were significantly older than the 3-year-olds. The SLI group and the 3-year-old group were comparable not only on the matching variable, the Reynell expressive score, but also on the Reynell receptive score. Statistical analyses failed to find significant differences between the groups on either the expressive or the receptive score, $t_s(12) = 0.75$ and 0.83 respectively, $p_s > 0.05$. There are two special observations to note here. First, as reported earlier, more than half of the

TABLE 2.3

Mean (and Standard Deviation) Scores for Cognitive and Language Tests for the SLI Children and the Language-Matched and Age-Matched Groups

Group	Age in months	CMMS ^a	Reynell-R ^b		Reynell-E ^c	
			Raw	Standard	Raw	Standard
			Scores	Scores	Scores	Scores
SLI	66.7	97.7	51.4	- 1.6	58.9	- 0.3
	(4.0)	(9.1)	(6.6)	(1.1)	(3.7)	(0.6)
Language- matched	47.0	118.1	53.9	+ 1.2	57.4	+1.0
	(5.4)	(4.3)	(4.0)	(0.6)	(3.4)	(0.9)
Age- matched	66.6	118.1	62.9	+ 1.2	66.7	+ 1.1
	(3.4)	(9.7)	(1.8)	(0.4)	(3.3)	(0.6)

a. CMMS = Columbia Mental Maturity Scale in standard scores with mean = 100, standard deviation = 16. b. Reynell-R = Reynell Developmental Language Scale-Receptive scale. c. Reynell-E = Reynell Developmental Language Scale-Expressive scale.

SLI children were broadly within age expectations on both the receptive and expressive scales of the Reynell at the time of the study, and the rest were at broad age levels on the expressive scale. However, as a group, they still performed significantly below their 5-year-old age peers on the expressive scale, $t(12) = 4.24, p < 0.05$ and the receptive scale, $t(12) = 4.42, p < 0.05$. Second, the SLI group earned lower nonverbal IQ scores than both the 3-year-old language-matched and the 5-year-old age-matched groups, and these differences in the CMMS were statistically significant $t_s(12) = 5.38$ and 4.07 respectively, $ps < 0.05$.

2.2. EXPERIMENTAL TASK

2.2.1. Procedures

The experimental task was designed to investigate whether a child could make reference to story characters in ways that would be clear to a listener. The child was asked to tell 16 stories developed from five different templates to a blindfolded puppet. The experimenter used three training stories to familiarize the child with the puppet to whom the stories were to be told, and with the story-telling task itself. The experimenter told the first two, and the child told the last training story. Before the training, the child was first introduced to the blindfolded puppet, Bear Bear. Here's what the experimenter said, in English translation.

EXPERIMENTER: "(Child's name), I bought a friend with me today. His name is Bear Bear. Look, his eyes got sick today and have bandages on. He can't see anything now. Bear Bear LOVES to read picture story books and he can't do that today. Poor Bear Bear! What shall we do? (Pause) Ah, let's look at some picture books and make up stories for him. Now, Bear Bear wants to talk." The experimenter spoke for Bear Bear in a pretend puppet voice.

BEAR BEAR: "yeaaaa!...that's great! So, you are going to look at some picture books and then make up stories to tell me. Oh, I am SO happy! Okay! I am going to sit right across from you and get ready to listen."

EXPERIMENTER: "Okay, I'll go first. Bear Bear, you'd better listen carefully. (Pause) This story is called (e.g.) SNACK. Oh, this book has no words. (Child's name), we'd

better look at the pictures carefully and make up a good story for Bear Bear. Okay! Let's see what this story is all about."

The experimenter sat next to the child at the table and Bear Bear was on a stand facing them at eye level. The experimenter looked at each of the colored pictures in the book with the child. As she did so, she would make an exclamation like, "ah oh!" "Hum?" or "Oh, no!" to show the child she was actively figuring out a story from the pictures, and to draw the child's attention to the events of the story. However, no pointing or other gestures were used at any characters or objects in the pictures. When finished, the experimenter turned back to the first picture and began to tell the first training story by giving one utterance for each picture.

Picture 1: *cung4 cin4 jau5 jat1 go3 naam4 zai2 hai2 dok6 sik4 gan2 beng2 gon1*
once-upon-a-time have one CL boy here eat ASP cracker
'Once upon a time there was a boy eating cracker.'

Picture 2: *gan1 zyu6 keoi5 hau2 hot3 zau6 dou2 di1 ngau4 naai5 le4 jam2 la3*
next he thirsty then pour CL milk come drink UP
'He was thirsty, then he poured some milk so he could drink it.'

Picture 3: *dim2 zi3 m siu2 sam1 dou2 se3 zo2 til ngau4 naai5*
how-know not careful pour-PRT ASP CL milk
'Guess what, he spilled the milk by accident.'

Picture 4: *gam2 jyul si4 keoi5 zau6 lo1 faai3 bou3 maat3 faan1 gon1 zeng6 zoengl toi2*
lak3

so therefore he then get CL cloth wipe back dry clean CL table

PRT

‘So, he got a cloth to wipe the table clean again.’

This format was repeated for the second story. At the third story, when it was the child’s turn to tell the story, the child was reminded once again that Bear Bear could not see, and that the child needed to look at the pictures carefully and make up a good story for him.

EXPERIMENTER: “(Child’s name), now it is your turn to tell Bear Bear a story. Remember? Bear Bear can’t see anything today. You have to look at the pictures really carefully and then make up a good story for Bear Bear.” The experimenter read out the title of the story from the cover, “This story is called CAR WASH.” The experimenter leafed through the pictures with the child. When finished, the experimenter turned back to the first picture and said, “Alright, there you go!” Then the child began.

After the third training story, Bear Bear got off his seat. With his face to the child, he told the child how much he loved the story and asked the child to tell him more. For those few children who refused to say anything at all about the pictures in the third training story, the experimenter would tell them the story once and have them tell the story back. Note that feedback to the child was always very general. The experiment was not designed to have the puppet make overt judgments about whether the child had successfully communicated about an intended referent. Any such judgments as a story was told would have affected the child’s subsequent reference as well as the structure of the narrative.

After the second and again third training story was told, the experimenter asked the child who the person involved in the key action in the event was. The experimenter asked, "I was not listening carefully. Who slipped and fell?" or "I forgot to listen. Who unplugged the rice cooker?" The purpose of the questions was to draw the child's attention to reference to the characters in the stories. Any noun phrase would be considered adequate.

The 16 stories were (quasi)randomized once and presented in the same order for all children. The procedure for these experimental stories was almost the same as for the training stories. As for each of the training stories, the experimenter first read out the title on the front cover of the picture book to the child. She leafed through the pictures in the book with the child once, and encouraged the child to watch carefully and find out what the story was about by saying "Let's see what this story is about." She refrained from making comments or pointing at any characters or objects on the pictures. After they went through the pictures once, the experimenter turned back to the first picture as she asked the child to tell the story to Bear Bear with a cue, "Now you tell it." The experimenter held the picture book and turned the page as the child told the story. Unlike during the training stories, the experimenter no longer made an exclamatory remark while looking at the pictures with the child. Nor did she repeat the task instructions, or ask the child a question after a story was told. The experimenter basically spoke little during the telling of the experimental stories, in order to avoid distracting the child's attention from the puppet, to whom the child was asked to tell the stories. On occasion when a child directed comments about the pictures to her, the experimenter first ignored him/her, or gave a minimal acknowledgment e.g., "Ah ha"; "I see."

After an unspecified number of stories depending on the child's attention and other factors, Bear Bear got off his seat, with his face to the child, gave the child some general

but motivating complements. They included "Hey, I love your stories. Tell me more, will you?" "Your stories are great!" "This is such an interesting story, tell me more, will you?" "You are such a great story teller!" "You can really make good stories" "Do you have more stories to tell?"

As the child proceeded to tell the story, the experimenter turned over to the next picture only after the child had finished what he had to say, as indicated by an utterance ended by a falling intonation or by a 7-second pause, or when a child remained silent at a picture after a 20-second wait. A few children, mostly 3-year-olds, remained silent for every picture of one or more story books. These children were given that picture book(s) to look at after all the stories were finished and asked again to tell that story to the puppet.

2.2.2. Materials

The 16 stories for the experimental task were created from five different templates. For each of templates II, III and IV, there were four stories, and for templates I and V, there were two stories. The structure of the templates is provided in Table 2.4, where X is the protagonist and Y is a second character. Each symbol represents a picture in the series, and indicates which character is acting. To illustrate, a story from Template II will start with the protagonist X acting in the first picture. A second character Y then appears in picture 2. The protagonist returns in picture 3 and continues in picture 4.

As can be seen, all but the two stories in template I involved both a protagonist and a minor character. Fourteen of the stories consist of four pictures and the remaining two stories in template V, of six pictures. The position of the entry picture for the minor character differs across story templates as does the point of reappearance of the protagonist. For example, the minor characters in templates II, III, and V enter the story in picture 2,

TABLE 2.4

The Structure of the Story Templates, Where X is the Protagonist and Y is a Second Character

		Picture					
	N of stories	1	2	3	4	5	6
Template I	2	X	X	X	X		
II	4	X	Y	X	X		
III	4	X	Y	Y	X		
IV	4	X	X	X	Y		
V	2	X	Y	Y	X	Y	X

whereas the minor character in template IV arrives in picture 4. The protagonist reappears after a differing number of intervening pictures related to the minor character, one in template II versus two in template III. Unique to the six picture stories, the minor character comes into the story more than once and the protagonist more than twice. The following describes the illustrations for one story from each of the templates. Appendices A and B contain the pictures accompanying the story DANCING from Template II and RIDING A BIKE from Template IV, respectively.

Template I: Drying the dishes

- Picture 1. X is drying the dishes.
- Picture 2. X drops a plate.
- Picture 3. X is sweeping the pieces into the dustpin.
- Picture 4. X is putting the pieces into the trash.

Template II: Dancing

- Picture 1: X is reading a book.
- Picture 2: Y is playing the piano.
- Picture 3: X is changing into her ballet shoes.
- Picture 4: X is dancing.

Template III: Swimming

- Picture 1. X is warming up by the pool.
- Picture 2. Y is getting into the water.
- Picture 3. Y is drowning.
- Picture 4. X is going to throw him a life belt.

Template IV: Riding a bike

- Picture 1. X is riding his bike.
- Picture 2. X runs into a rock.
- Picture 3. X is falling off his bike.
- Picture 4. Y is calling the police for him.

Template V: Getting ready for dinner

- Picture 1: X is reading the newspaper.
- Picture 2: Y is cutting the vegetables.
- Picture 3: Y is stir-frying the vegetables.
- Picture 4: X is setting the table.
- Picture 5: Y is putting the vegetables on the table.
- Picture 6: X is putting a bowl of rice on the table.

Each of the 16 expected stories consisted of one simple episode with the basic elements of setting, event, and resolution. In the 14 stories in which there were two characters, both were of the same gender and age. However, they showed distinct differences in appearance, e.g., colours and styles of hair and outfits, and each engaged in different actions as agents. The two characters appeared together in the same picture only when the minor character entered the story for the first time, or when the protagonist returned to the story. When this happened, the newly entering or returning, character was in the foreground, while the continuing character would be in the background. The character in the foreground was usually drawn to face forward and was distinctively larger in size so that it looked closer to the child. It also engaged in an action different from the one depicted in the previous picture. The contrast between foreground and background was to draw the child's attention to the character who was appearing for the first time, or returning to the story.

Pictures in all of the 16 stories were colored and each story was individually bound as a "book." The title of the story was printed on the front cover. The title only stated the theme of the story, and made no reference to any characters (e.g., "Riding a bike"). Other than the titles, there were no words in the picture books.

2.2.3. Data collection

All typically developing children were seen in a quiet room in their schools, and children with SLI were seen in their homes. Except for the 7- and 12-year-olds, who were given fewer standardized tests, the children were seen on two separate days for the experimental task, and the supplementary tasks (to be described in the next Section 2.3), with the following schedule:

- Day One: Warm up small talk
Columbia Mental Maturity Scale
Reynell Developmental Language Scale
- Day Two: Supplementary task--Noun phrase probe
Supplementary task--Sentence imitation
Experimental task--Story telling
Supplementary task--Comprehension probe
Hearing screening

All children were given the tasks in the same order. All of the children's responses in standardized tests and supplementary tasks were audiotaped and later transcribed by the experimenter for scoring. The children's stories for the experimental task were audiotaped and transcribed by an adult native speaker of Cantonese Chinese.

2.2.4. Scoring

2.2.4.1. Transcription reliability

Each of the participating children told 16 stories to a puppet in the experimental task. Ten percent of these stories were independently transcribed by a second adult native speaker of Cantonese Chinese to serve as a reliability check. These 86 stories came from 43 children who were randomly selected from each age or language group in numbers proportional to group size. Two stories were chosen from each of the 43 children, with selection of particular stories balanced across groups. Word-for-word agreement in transcription was 97.5%.

2.2.4.2. Referential adequacy and referential functions

Reference is operationally defined in this study as a referential act in which the child uses linguistic forms to designate to the listener the particular character being referred to. When the listener can successfully identify the character, the referential act is considered adequate. Acts selected for study can be classified as one of three different types of referential function:

Maintenance is the referential function in which the speaker continues to refer to the protagonist immediately after it has been introduced.

Introduction is the referential function in which the speaker refers to the minor second character after the protagonist has been introduced.

Reintroduction is the referential function in which the speaker refers to the protagonist again after he has talked about the minor character in his last utterance(s).

A fourth function, introduction of the main protagonist in the first picture of the story was also examined. It was not rated for referential adequacy, since the questions asked of the expert listeners would be inappropriate. However, these referring expressions were tallied by the examiner and compared with those used to introduce the minor character.

Table 2.5 lists the three referential functions that are the focus of this study and the story templates and pictures that were designed to evoke them. The number of referential acts for each function across stories is also indicated.

TABLE 2.5

The Three Types of Target Referential Functions and the Story Templates and Pictures that were Designed to Evoke them

	Referential function		
	Maintenance	Introduction	Reintroduction
Template,	Temp ^a I, Pic. ^b 2 (2)	Temp. II, Pic. 2 (4)	Temp. II, Pic. 3 (4)
Picture (N)	Temp. IV, Pic. 2 (4)	Temp. III, Pic. 2 (4)	Temp. III, Pic. 4 (4)
		Temp. V, Pic. 2 (2)	Temp. V, Pic. 4 (2)
		Temp. IV, Pic. 4 (4)	Temp. V, Pic. 6 (2)
Total N	6	14	12

a. Temp. = Template. b. Pic. = Picture

2.2.4.3. Expert listeners

In this study, the development of reference was examined using a communication approach. Rather than using a prior scoring criteria, the child's ability to make adequate reference to story characters was evaluated by how well a listener could successfully make judgments about who they were talking about. The 'listeners' in this case were adult native speakers of Cantonese Chinese who were asked to read the story transcripts as if they were listening to the stories on line, and make judgments related to the identity of the character the child had just mentioned. These expert 'listeners' were recruited by word of mouth and through an advertisement at the UBC Student Career Services. Twelve out of thirteen respondents were available at the designated times, passed the screening test, and were selected. All were female undergraduate students pursuing degrees in different academic disciplines. These students were recent immigrants from Hong Kong, and spoke

Cantonese Chinese at home. They all passed a screening of spoken Cantonese and written Chinese. At the end of their participation, these expert 'listeners' received an honorarium.

2.2.4.4. Preparation of transcripts and questions for expert listeners

On each of the story transcripts given to the expert 'listeners', the predicate which related to the first picture, the predicate which related to the picture in which the targeted referential function was to be attempted, and the predicate related to the immediately prior picture were underlined in red ink. Wherever a targeted referential function was identified, a red arrow was drawn at the end of the utterance. The arrow signaled the expert 'listeners' to stop reading and answer two questions about the referent. If a child did not say anything about a given picture, no referential function was identified. If a child used a predicate that did not exactly match, but nevertheless seemed related to, the action depicted in the picture, the predicate was underlined and referential adequacy was scored. Please refer to Appendix C for a sample transcript marked for predicates and referential functions.

As mentioned earlier, the expert 'listeners' were asked to answer two questions about each targeted referential act. The following are the questions in order:

1. With reference to the action underlined here, and the action in the previous utterance, is this child talking about the same, or a different character?
2. If your answer to question 1 is "different," has the child talked about this character in an earlier sentence? If your answer is "yes," please write down the person who is performing the underlined action.

The two questions were printed on a note card for the 'listeners' to refer to whenever a red arrow was encountered in a transcript. Each marked her copy of the transcripts before moving on to the next arrow. The 'listeners' were encouraged to give an immediate and intuitive answer to each of the questions without extensive analysis.

Each of the expert 'listeners' was asked to read all 16 story transcripts from each of the 17 or 18 children. The set of transcripts for each 'listener' consisted of stories from the whole age range of typically developing children, as well as children with specific language impairment. Each set of transcripts was randomized by child and each child's stories were 'listened to' in the same order as the stories had been told. Each 'listener' finished her transcripts in two to three sessions of about two hours, within a week's time. Before the expert 'listeners' proceeded with their own sets of transcripts, explanation of the questions and training on the task were provided using transcripts of the two training stories. The experimenter went through these transcripts explaining the decision process, step by step, and providing appropriate answers. The 'listeners' then proceeded with their own evaluative answers. The 'listeners' were not required to meet particular training criteria since the task assumed no 'correct' answers.

2.2.4.5. Referential adequacy scores

Each targeted referential act attempted by a given child was 'listened to' and evaluated by four independent expert 'listeners'. Each of these listeners answered one or two questions about the referential act and a referential adequacy score was derived from their responses. Referential adequacy was operationalized in the following fashion. The referential act was scored as being 'adequate' and the child received one point when at least three out of the four 'listeners' answered the question(s) in a way that was appropriate for that type of referential function. For the child to receive one point in a Maintenance act, the

'listeners'' answer would have to be "the same," and in an Introduction act, the 'listeners'' answers would have to be "different" and "no," and for a Reintroduction to the second character act, the 'listeners' answers would have to be "different" and "yes," and a noun phrase which specified the character. Note that in order to come up with an appropriate answer, the 'listeners' could use any information, including but not necessarily exclusive to, the linguistic form chosen for that referential act.

When a child totally failed to produce an expected referential act, a conservative scoring strategy was adopted and the child received a 0 score for referential adequacy. The child's score for each type of referential function was summed and converted into a percentage of adequate acts.

2.2.4.6. Dominant referring expressions for each type of referential functions

For each type of referential act, the referring expressions used by each child were identified and tallied. The following lists the different referring expressions that were used by the children for the referential functions.

Existential presentative expression *jau5 jat1 go3 naam4 zai2*

have one Cl boy

'there is a boy'

Proper noun *mei5 jin1*

Mei Yin

ze4 zel

sister

Classifier NP	<i>go3 naam4 zai2</i> CL boy 'one boy'
Demonstrative NP	<i>go2 go3 naam4 zai2</i> that CL boy 'that boy'
Determiner <i>ling6 ngoi6</i> 'another' NP	<i>ling6 ngoi6 jat1 go3 naam4 zai2</i> another one CL boy 'a different boy'
Relative NP	<i>sik6 jyun4 je5 go2 go3 neoi5 zai2</i> eat VP thing that CL girl 'the girl who has finished eating'
Pronoun	<i>keoi5</i> he/she
Possessive NP	<i>naam4 zai2 go3 (ge3) pang4 jau5</i> boy CL (POSS) friend 'the boy's friend'

The dominant form(s) used to achieve referential adequacy for each referential function were identified for each age group. A dominant form was defined as the form used by the group in at least 20% of their referentially adequate responses, and used at all by at least half of the children in the group.

2.3. SUPPLEMENTARY TASKS

Three supplementary tasks were designed to serve two purposes: to ascertain whether a child had knowledge of the referring expressions necessary for the referential functions, and to determine whether the child could distinguish the two characters involved in the stories. Results from these tasks would provide independent evidence for explanations of their performance on the referential adequacy measure.

2.3.1. Noun phrase probe: Procedures and scoring

A noun phrase probe was designed to examine the child's knowledge of referring expressions as they are used to talk about people in the simpler context of a phrase or a short sentence. The probe consisted of four scenes acted out by the examiner with figures and small toys. Two identical figures participated in half of the scenes, and the rest involved two figures that were of the same gender but different appearances, e.g., clothes, hair color. At the end of each scene, another larger figure named "Big Sister" appeared to pose a question to the child. The scenes were randomized once and presented in the same order to all children.

The child and the examiner sat across the table from each other. The child was told to watch very carefully what was going to happen to the small figures because Big Sister would come and ask him/her questions at the end. For each scene, the two figures appeared together and the examiner said to the child, "Here are two boys. They do not look the same. Look!" Then Figure 1 performed an mischievous action on an object, e.g., scribbling on a piece of a paper, and then running away to hide under the table. Big Sister then appeared and asked the child if it was Figure 2, the one staying behind, who did the mischief. Here's what Big Sister said to the child while facing Figure 2, "Was it him/her

who scribbled on the paper?" If the child responded with a "No," then the follow up question was asked, "Then who was it?" The child was given general compliments such as "Well done!" "You have been watching carefully!" on a random basis.

To answer the follow up question accurately, the child only needed to use a noun phrase that would specify the mischievous figure in the scene. Any one of the following four types of noun phrases (examples provided) would well serve that purpose:

a) Determiner *ling6 ngoi6* 'another' or *dai6 ji6* (the other) NP, e.g.,

ling6 ngoi6 go1 go3 naam4 zai2

another that CL boy

'a different boy'

dai6 ji6 go3 naam4 zai2

the other CL boy

'the other boy'

b) Adverbial *tau4 sin3* (just now) NP, e.g.,

tau4 sin3 go1 go3 naam4 zai2

just now that CL boy

'the boy just gone'

c) Relative NP, e.g.,

nei5 saul maai4 go1 go3 naam4 zai2

you hide PRT that CL boy

'that boy you put away'

d) Locative NP, e.g.,

haa6 min6 go1 go3

under that CL

'that one under'

jap6 min6 go1 go3

inside that CL

'that one inside'

Responses to the noun-phrase probes were scored in two ways. First, the child again received one point when "No" was correctly given as the answer to the probe question as to whether the mischievous figure, was the same as the figure staying behind. The maximum score for this task was four points, one for each item. Second, the different types of noun phrase that were used for reference to the mischievous figure in the four scenes were tallied for each child.

2.3.2. Sentence imitation probe: Procedures and scoring

This probe was also designed to examine the child's knowledge of the referring expressions that could be used for the referential functions. Each child was asked to repeat

a set of nine sentences. These sentences were of equal length, each consisting of nine syllables. In all but one case, the nine syllables made up eight words, with most words consisting of one syllable. Each sentence began with one of the four different types of referring expressions (number of items in brackets): Existential presentative expressions (2), Demonstrative NP (1), Relative NP (4), Determiner *ling6 ngoi6* NP (2). Please refer to Appendix D for a list of the sentences. The remainder of each sentence consisted of a simple predicate adjective, or verb with or without a noun. There were no particles at the end of the utterance. For the probe, the child was asked to repeat exactly what the experimenter said. To ensure the child understood the task, it began only when the child was able to imitate verbatim at least two out of the three shorter phrases that were used for training.

The child received 1 point when the referring expression was repeated verbatim. The maximum score for Existential expression was 2, Relative NP was 4, Determiner *ling6 ngoi6* ‘another’ NP was 2, and Demonstrative NP was 1. The maximum score for the probe was therefore 9.

2.3.3. Comprehension probe: Procedures and scoring

This probe was designed to examine whether the child could distinguish the two characters that were involved in the stories. The examiner quizzed the child on two of the 16 stories, one from template II and one from template V, after all 16 stories were told. The examiner told the stories back to the child, with the accompanying picture books, according to prepared scripts. Names were given to each of the two characters to decrease linguistic demand, and hence to facilitate the child’s identification of the two different characters in the story. At the end of each story, the child was quizzed as to

whether it was the same character who was involved in two of the actions mentioned in the story. The two questions were:

1. As for reading the newspaper and cutting the vegetables, were they done by the same person?
2. As for playing hide-and-seek and building blocks, were they done by the same person?

The child received 1 point when he/she gave a “No” response. The maximum score for this task was 2 points.

CHAPTER THREE

RESULTS

In this Chapter, I first present results pertaining to the development of reference in Cantonese-speaking children with typical development, followed by children with SLI. In each case, findings from the experimental story-telling task will be used to answer five general research questions that motivate this study:

1. At what age do Cantonese-speaking children refer adequately to the different characters they are talking about in their stories?
2. Do children succeed with certain referential functions in Cantonese at earlier ages than others?
3. Do Cantonese-speaking children refer to story characters at different points in the discourse with equal clarity?
4. Which referring expressions do Cantonese-speaking children use for specific referential functions?
5. Do Cantonese-speaking children with SLI show particular difficulty in the mastery of referential functions?

3.1. THE DEVELOPMENT OF REFERENCE IN TYPICALLY DEVELOPING CHILDREN

The primary goal of this study was to investigate the development of reference in Cantonese-speaking children. To this end, children aged 3, 5, 7 and 12 were asked to tell stories from sixteen sets of pictures. Each child's stories were scored for referential adequacy in three types of referential function: Maintenance of a known character, Introduction of a second, new character, and Reintroduction of a known character. The

Maintenance function was set up only in picture 2 in story templates I and IV. The Introduction function was set up early in picture 2 in story templates II, III, and V, and late in picture 4 in story template IV. The Reintroduction function was set up early in picture 3 in story template II, and late in picture 4 in story templates III and V, and again in picture 6 in story template V. Forms of referring expressions were noted for each referential act, in early and in late discourse positions.

3.1.1. Referential adequacy: Function

At what age do Cantonese-speaking children refer adequately to the different characters they are talking about in their stories? Table 3.1 lists the mean (and standard deviation) referential adequacy score for each group of children on the three types of functions. Recall that a referential act was considered adequate if 3/4 'listeners' could correctly identify the character. Scores for each function were the percentage of referential acts that met this criterion.

As is clear from Table 3.1, children's ability to make clear reference increased with age. The 3-year-olds were referentially adequate in very few referential acts.⁶ The 5-year-olds made clear reference much more often, the 7-year-olds were approaching, and the 12-year-olds reached, near perfect reference. A two-way mixed-model ANOVA, Group (4) by Function (3), confirmed a significant main effect of Group, $F(3,39) = 81.58, p < 0.05$. Post hoc Scheffe analysis⁷ indicated that the 7-year-olds performed significantly better than

⁶ Only the 3-year-old group showed considerable failure to attempt the referential functions. On average, each 3-year-old child failed to attempt 3.6 out of the 32 referential functions. There was a wide variability in the number of skipped opportunities among the children. These were evenly distributed across the three types of referential functions. When the adequacy scores were recalculated to include only the attempted referential acts, the 3-year-old group received a higher score for Maintenance (85%), but the same low scores for Introduction (15%) and Reintroduction (2%). These changes would not have affected the developmental patterns reported here.

⁷ An alpha level of 0.05 was used for this post-hoc Scheffe analysis and hereafter.

TABLE 3.1

Mean (and Standard Deviation) Referential Adequacy Scores by age Group and Referential Function

Age group	N	Referential function			
		Maintenance	Introduction	Reintroduction	Combined
3	10	0.70 (0.25)	0.13 (0.20)	0.02 (0.04)	0.28
5	13	0.97 (0.06)	0.65 (0.23)	0.38 (0.20)	0.67
7	12	0.94 (0.13)	0.92 (0.07)	0.66 (0.17)	0.84
12	8	1.00 (0)	0.92 (0.07)	0.84 (0.12)	0.92
All		0.90	0.65	0.46	

the 5-year-olds, who in turn performed significantly better than the 3-year-olds. Between the 7- and 12-year-olds, no significant difference was found.

Do Cantonese-speaking children succeed with certain referential functions at earlier ages than others? Children's ability to make clear reference also changed with the type of referential function. Table 3.1 shows that, all age groups combined, children earned the highest referential adequacy score when Maintaining a character; they were somewhat less adequate when Introducing a second character and least adequate when Reintroducing a character. The two-way mixed-model ANOVA, Group (4) by Function (3), also confirmed this main effect for Function, $F(2, 78) = 91.78, p < 0.05$. Post-hoc Scheffe analysis indicated that the referential adequacy score for Maintenance was significantly higher than for Introduction, which in turn was significantly higher than for Reintroduction.

Variability in the group differences for referential adequacy scores was noted between the three functions. The two-way mixed-model ANOVA, Group (4) by Function (3), revealed a significant interaction effect, $F(6, 78) = 10.72, p < 0.05$. Inspection of the means showed that differences among the 5-, 7- and 12-year-olds for Maintenance were minimal, as they reached near perfect reference. The same was true between the 7- and 12-year-olds for Introduction. Reintroduction was the only function in which each age group obtained referential adequacy scores that set them distinctly apart from one another. An interesting point to note was that while the 5-year-olds showed a steady decrease in referentially adequacy scores across the three functions, the 3-year-olds showed a dramatic drop, particularly between Maintenance and Introduction.

In order to further explore the group findings, an analysis of the pattern of referential adequacy scores was conducted on a child-by-child basis. A cut-off score was set at 50%, and each child received a pass (+) when s/he received a score at or above the cutoff on a given referential function. Based on the order of difficulty for the three functions evident in the grouped data, the following developmental patterns were hypothesized:

	Maintenance	Introduction	Reintroduction
Level 1	-	-	-
Level 2	+	-	-
Level 3	+	+	-
Level 4	+	+	+

Each child was assigned a developmental level according to his/her "pass/fail" pattern across the three functions. All children fell into one of the four developmental levels. Table 3.2 indicates the number of children in each age group at each level.

TABLE 3.2

Number of Children in each Developmental Level by Group

Level	Age group			
	3	5	7	12
Level 1	2	0	0	0
Level 2	7	2	0	0
Level 3	1	6	1	0
Level 4	0	5	11	8
Total	10	13	12	8

As is clear in Table 3.2, most of the 3-year-olds were at Level 2, showing success in referential adequacy only when Maintaining a character. A majority of the 5-year-olds were split between Level 3 and Level 4. Some demonstrated success when Maintaining and Introducing a character, while others when Maintaining, Introducing, and also Reintroducing a character. Almost all of the 7-year-olds and all 12-year-olds had success in all referential functions. This child-by-child analysis confirmed the group findings on the developmental order of referential functions that was implicit in the group findings.

3.1.2. Referential adequacy: Discourse position

For the Introduction and Reintroduction functions, reference to characters was made early as well as late in the discourse. Table 3.3 gives the mean (and standard deviation) referential adequacy scores in percentages for the early versus late Introduction functions and early versus late Reintroduction functions for the four age groups.

TABLE 3.3

Mean (and Standard Deviation) Referential Adequacy Scores by Group and by Discourse Position in the Introduction and Reintroduction Functions

Referential function: Discourse position					
Age group	<i>N</i>	Intro ^a : Early	Intro: Late	Reintro ^b : Early	Reintro: Late
3	10	0.14 (0.20)	0.10 (0.24)	0.0 (0.0)	0.03 (0.07)
5	13	0.61 (0.28)	0.77 (0.22)	0.37 (0.28)	0.44 (0.23)
7	12	0.89 (0.10)	0.98 (0.07)	0.75 (0.15)	0.67 (0.28)
12	8	0.90 (0.09)	0.97 (0.09)	0.81 (0.17)	0.92 (0.13)
mean		0.63	0.71	0.47	0.50

a. Introduction. b. Reintroduction.

Do Cantonese-speaking children at different ages refer to story characters at different points in the discourse with equal clarity? For both Introduction and Reintroduction, children generally made more adequate reference when the referential act occurred later in the discourse. This difference on discourse position was found to be significant, $F(1, 39) = 5.96, p < 0.05$ in a three-way mixed-model ANOVA, Group (4) by Function (2) by Distance (2), as were the main effects for Group, $F(3, 39) = 77.86, p < 0.05$, and Function, $F(1, 39) = 36.93, p < 0.05$, and the Group by Function interaction, $F(3, 39) = 3.32, p < 0.05$. No interaction effects for distance proved significant, although the 7-year-olds showed a reverse pattern in the Reintroduction function. The Group and Function effects are essentially the same as reported in the prior section.

3.1.3. Referential adequacy: Linguistic forms

As reviewed in Chapter 1, there are different forms of referring expressions for known and new referents. Which referring expressions do Cantonese-speaking children use for specific referential functions?

For this analysis, the dominant forms used to achieve referential adequacy in each referential function were identified for each age group. A dominant form was defined as the form used by the group in at least 20% of their referentially adequate responses, and used at all by at least half of the children in the group. Table 3.4, Table 3.5, and Table 3.6 show the different dominant forms identified for each age group of children in each type of referential function. Frequency of forms used to achieve referential adequacy can be found in Appendix E.

TABLE 3.4

Dominant Forms for Maintenance of Reference to a Character and
Overall Frequency of use by Group

Age group	Form (% use)	
	pronoun	zero form
3	----	81%
5	68%	30%
7	63%	32%
12	63%	33%

For referent Maintenance, two dominant forms, both definite, were identified across the age groups, and these forms accounted for virtually all adequate responses. The 3-year-olds used only the zero form to maintain reference to the protagonist from the first to the second picture. Their utterance for the second picture typically included just a predicate. The older groups of children used primarily the pronoun, followed by zero forms, to maintain reference to the protagonist as the story moved to the second picture.

Here is an example of the use of the lexical pronoun *keoi6* (he/she) from a 5-year-old child (# V 01) telling the story DRYING THE DISHES from Template I.

Preceding utterance

cung4 cin4 le1 zau6 jau5 jat1 go3 neoi6 zai2 hai2 dok6 maat3 gan2 go2 go3 dip6
once-upon-a-time PRT then have one CL girl here drying ASP that CL plate
'Once upon a time, a girl was drying a plate.'

Target utterance for Maintenance

gan1 zyu6 keoi6 m siu2 sam1 daa1 laan4 zo2 go2 go3 dip6
afterward she not careful break V-PRT ASP that CL plate
'She wasn't careful and broke the plate.'

Here is an example of the use of the zero pronoun from a 5-year-old child (# V 03) telling the story RIDING A BIKE from Template I.

Preceding utterance

jau5 go3 go4 go1 hai2 dok6 caai2 daan1 cel
have CL brother here ride bike
'A boy is riding a bike.'

Target utterance for the Maintenance function

m siu2 sam1 ceong4 dok2 go3 sek6 tou4

not careful run-into V-PRT CL rock

‘(He) wasn’t careful and ran into a rock.’

In sum, all groups of children used definite referring expressions to achieve referential adequacy for the Maintenance function.

For Introduction to a second new character, no dominant forms could be identified for the 3-year-olds. As a group, they received a low score for referential adequacy in this function. For the 5-, 7- and 12-year-olds, the Existential expression was the dominant

TABLE 3.5

Dominant Forms for Introduction to a Second Character and Overall Frequency of use by Group

Age group	Form (% use)	
	Early Context	Late Context
3	no dominant form	no dominant form
5	Existential expression (48%) Determiner NP (24%)	Existential expression (70%)
7	Existential expression (47%) Possessive NP (21%)	Existential expression (60%)
12	Existential expression (47%) Possessive NP(33%)	Existential expression (42%) Possessive NP(32%)

form in both discourse positions. This expression was used to indicate clearly to the listener that there was now a new character, different from the one that had been talked about. Here is an example of the use of the Existential expression from a 7-year-old (#VII 1) telling the story FISHING from Template III.

Preceding utterance

cung4 cin4 jau5 go3 siu2 pang4 jau5 hai2 hoi2 bin1 go2 dok6 diu3 jyu4
 once-upon-a-time have CL little kid at shore there fishing
 'Once upon a time, there was a little kid fishing at the shore.'

Target utterance for the Introduction to the second new character

jau5 go3 siu2 pang4 jau5 tau1 siu2 pang4 jau5 go2 di1 saam1 man6 ci4
 have CL little kid steal little kid those sandwich
 'There was a little kid stealing the little kid's sandwiches.'

The 5-year-olds also used a second high frequency form, Determiner *ling6 ngoi6* 'another' NP, to refer to a new character early in the discourse. Here is an example of the use of the Determiner *ling6 ngoi6* 'another' NP from a 5-year-old (#V 1) telling the story DANCING from Template II.

Preceding utterance

cung4 cin4 le1 zau6 jau5 jat1 go3 neoi6 zai2 hai2 dok6 tai2 gan2 syul
 once-upon-a-time PRT then have one CL girl here read ASP book
 'Once upon a time, there was a girl reading a book.'

Target utterance for the Introduction to the second new character

gan1 zyu6 ling6 ngoi6 jat1 go3 neoi6 zai2 zau6 hai2 dok6 taan4 gan2 kam4

afterward another one CL girl then here play ASP piano

‘Then a different girl was playing the piano.’

Possessive NPs were the alternate dominant form for the 7-year-olds early in the discourse and for the 12-year-olds both early and late in the discourse. Here is an example of the use of the Possessive NP from a 12-year-old (#XII 6) telling the story DANCING from Template II.

Preceding utterance

jau5 jat1 jat6 jau5 jat1 go3 neoi6 hai4 zi2 zau6 hai2 dok6 tai2 gan2tou4 syu1

have one day have one CL girl then here read ASP picture book

‘One day, there was a girl reading a picture book.’

Target utterance for the Introduction to the second new character

kam2 keoi5 go3 ze4 ze1 zau6 hai2 dok6 taan4 gan2 kam4

so she CL sister then here play ASP piano

‘Then her sister was playing the piano.’

In sum, the 5-, 7- and 12-year-old children used primarily an indefinite referring expression, i.e., the existential presentative expression, to achieve referential adequacy in the Introduction function. However, they also used two other referring expressions, i.e., Determiner *ling6 ngoi6* ‘another’, and Possessive NP which can be either definite or indefinite, but were interpreted by the ‘listeners’ as indefinites in this story context.

TABLE 3.6

Dominant Forms for Reintroduction of a Referent and Overall Frequency of use
by Group

Age group	Form (% use)	
	Early Context	Late Context
3	no dominant form	no dominant form
5	Pronoun (44%)	Demonstrative NP (38%) Pronoun (29%)
7	Demonstrative NP (25%) Relative NP (25%); Pronoun (22%)	Proper noun (25%) Demonstrative NP (20%)
12	Pronoun (38%); Demonstrative NP (23%)	Proper noun (30%) Relative NP (20%) Demonstrative NP (20%)

For Reintroduction of a referent, no dominant forms could be identified for the 3-year-olds. Few children achieved referential adequacy in this function. For 5-, 7-, and 12-year olds, a range of dominant forms was identified, each at lower frequencies than was seen in the other functions. Two forms were used frequently by children in all of the older age groups, both early and late in the discourse, i.e., Demonstrative NP and Pronoun. Here is an example of the use of the Demonstrative NP from a 5-year-old (#V 12) telling the story SWIMMING from Template III.

Preceding utterance

keoi5 zau5 lai5 cam4 lok6 seoi2 lai

he soon drown down water PRT

‘He is drowning soon.’

Target utterance for the Reintroduction to the protagonist

kam2 lei1, lei1 go3 siu2 pang4 jau5 zau5 ling1 go3 seoi2 pou5 bei6 keoi5

so PRT PRT this CL little kid then bring CL life belt to he

‘Then this little kid brings him a life belt.’

Here is an example of the use of the pronoun from a 7-year-old (#VII 1) telling the story DANCING from Template II.

Preceding utterance

ze4 ze1 hai2 dok6 taan4 kam4

sister here play piano

‘Sister is playing the piano.’

Target utterance for the Reintroduction to the protagonist

keoi5 zoek6 zo2 baal leoi4 mou3 go2 di1 haai4

she wear ASP ballet those shoe

‘She has put on those ballet shoes.’

The remaining dominant forms were used only by the 7- and 12-year-olds, generally late in the discourse, i.e., Proper noun and Relative NP. Here is an example of the use of the Proper noun from a 12-year-old (#XII 7) telling the story SWIMMING from Template III.

Preceding utterance

keoi5 zau5 jan1 wai4 m sik2 jau4 seoi2 ge3 jyun4 gu2 so2 ji5 zau5 zam3 can1 lo
he then because not know swim reason therefore then drown V-PRT PRT
'Because he doesn't know how to swim, he is getting drowned.'

Target utterance for the Reintroduction to the protagonist

kam2 siu2 ming4 le2 zau5 zik1 hak1 lok1 seoi2 heoi3 gau3 keoi5 la1
so siu2 ming4 PRT then right away down water to save he PRT
'Then Siu ming gets into the water right away to save him.'

Here is an example of the use of the Relative NP from a 7-year-old (#VII 8) telling the story SWIMMING from Template III.

Preceding utterance

keoi5 zam3 can1 wo1
he drown ASP PRT
'He is getting drowned.'

Target utterance for the Reintroduction to the protagonist

zou6 gan2 wan6 dung6 go3 naam4 zai2 paau1 go3 seoi2 pou5 bei2 zuk4 can1
go2 go3 jan4
do ASP exercise CL boy throw CL lifebelt to choke V-PRT
that CL man
'The boy who is stretching throws a life belt to the man who is choking.'

In sum, the 5-, 7-, and 12-year-olds used only definite referring expressions (e.g., Pronoun, Demonstrative NP, Relative NP) to achieve referential adequacy in this

Reintroduction function. The 7- and 12-year-olds also used referring expressions (i.e., Proper noun) that could be considered definite in the discourse context.

3.1.4. Summary

Children in this study demonstrated increased success in referential adequacy between 3 and 12 years of age. The 3-year-olds were referentially adequate in very few referential acts. The 5-year-old children made clear reference much more often. The 7-year-olds were approaching, and the 12-year-olds reached, near-perfect reference. Across all age groups, some referential functions were more difficult than others, with Maintenance of a character being the least difficult, followed by Introduction to a second new character, and Reintroduction to a known character. Individual analysis of developmental levels also confirmed this trend. Across all age groups, reference was generally more adequate when the Introduction or the Reintroduction function came late rather than early in the discourse. Finally, children in this study generally used systematically different referring expressions for the three referential functions. For Maintenance, the dominant forms were pronouns and zero forms; for Introduction, Existential expressions and Possessive NPs; for Reintroduction, pronouns and Demonstrative NPs. Pronouns were the only forms dominant in more than one function. In addition to the forms used by children at all ages, the 7- and 12-year-olds used Proper nouns and Relative NPs particularly for late Reintroduction in the discourse.

3.1.5. Noun phrase and sentence imitation probes

The noun phrase and sentence imitation probes were given to examine further whether the children had knowledge of the noun phrase types needed for the referential functions. Recall that the noun phrase probe consisted of four scenes acted out by the

examiner with two small figures and toys. At the end of each scene, another larger figure named "Big Sister" appeared to pose two questions to the child. Table 3.7 gives the mean (and standard deviation) score for a correct "No" response to the first question for each age group.

Children generally had no problems with the first question in the probe. Almost all 3-year-olds and all of the 5-, 7-, and 12-year-olds were able to say "No," indicating that it was not the figure staying behind who did the mischievous act. Only one 3-year-old gave a wrong answer for three or more items. Given this success on question one, children's use of noun phrases for reference could be examined in the follow up *who*-question: "Then who is it?" To answer the experimenter's question, the children used a wide range of noun phrases for making reference to the toy figure. This included noun phrases modified by determiner *ling6 ngoi6* 'another', a temporal adverbial *tau4 sin3* 'just now' and a relative clause. Noun phrases modified by a locative *haa6 min6* 'under' or *jap6 min6*

TABLE 3.7
Mean (and Standard Deviation) Score for Correct Response to the First Question
in the noun Phrase Probe for each age Group

Age group	Number correct
3	3.5 (1.0)
5	4.0 (0)
7	4.0 (0)
12	4.0 (0)
max. = 4	

'inside' were also common. All of these noun phrases often ended with the head noun omitted, which is appropriate in this context of use. Most children used one or two of these different noun phrases consistently for all four items in this probe.

Determiner *ling6 ngoi6* 'another' NP

hai6 ling6 ngoi6 go1 go3

be another that CL

'a different one'

hai6 dai6 ji6 go3

be second CL

'the other one'

Adverbial *tau4 sin3* 'just now' NP

tau4 sin3 go1 go3

just now that CL

'that one just now'

Relative NP

nei5 sau1 maai4 go1 go3 naam4 zai2

you hide PRT that CL boy

'that boy you put away'

Locative NP

haa6 min6 go1 go3

under that CL

'that one under'

jap6 min6 go1 go3

inside that CL

‘that one inside’

Since the goal of this probe was to find out if children knew the referring expressions needed for reference to characters in the experimental stories, use of Determiner *ling6 ngoi6* ‘another’ NP and Relative NP was analyzed on a child-by-child basis. Determiner *ling6 ngoi6* ‘another’ NP would make a clear Introduction to the second new character, and Relative NP would make a clear Reintroduction to the protagonist returning to the story. Table 3.8 lists the number of children who used each of these forms in each age group.

As is clear from Table 3.8, Determiner *ling6 ngoi6* ‘another’ NPs were a not popular option in children’s responses to the follow up question about the toy figure. No children in the 3-year-old group and just one child in each of the three older groups used

TABLE 3.8

Children who used Determiner NPs or Relative NPs
in the noun Phrase Probe by Group

Age group	Determiner NP	Relative NP
3 (<i>n</i> =10)	0	1
5 (<i>n</i> =13)	1	6
7 (<i>n</i> =12)	1	2
12 (<i>n</i> =8)	1	8

this noun phrase at all. More children used Relative NP in their responses. One 3-year-old, six 5-year-olds, two 7-year-olds and all of the 12-year-olds used this noun phrase type at least once.

In the imitation probe, children were asked to imitate nine different sentences and awarded one point for each exact repetition of the subject noun phrases. Table 3.9 gives the mean (and standard deviation) scores for each age group:

The general data pattern is strongly developmental and unremarkable: the older the children, the more accurate they were in repeating the sentences. The 3-year-olds were able to imitate fewer than 50% of the subject noun phrases accurately; the 7- and 12-year-olds were almost consistently accurate.

The primary purpose of this task was again to ascertain children's knowledge of referring expressions, i.e., Existential expressions, Relative NPs, Determiner *ling6 ngoi6*

TABLE 3.9

Mean (and Standard Deviation) Scores for the Imitation Probe by age Group

Age group	Number correct
3	4.2 (2.8)
5	7.5 (1.0)
7	8.2 (0.8)
12	8.9 (0.4)
(max. = 9)	

NPs, and Demonstrative NPs. Both Existential expressions and Determiner *ling6 ngoi6* NPs could be used to Introduce a second character, and Relative NPs could be used to Reintroduce a character. Demonstrative NPs could be used to Maintain or to Reintroduce a character. Table 3.10 lists the number of children who passed each type of referring expressions from each of the age groups. "Pass" here is defined as exact repetition of at least half of the items for that type of referring expressions. This would require imitation of at least one Existential expression, one Demonstrative, one Determiner, or two Relative NPs.

In the 3-year-old group, all but two children were able to imitate at least one of the two forms that could be used for Introduction of a second character: Existential

TABLE 3.10

Number of Children who used Existential Expressions, Determiner NPs, Relative NPs, or Demonstrative NPs in the Imitation task by Group

Age group	Exist. Expression	Determiner NP	Relative NP	Demonstrative NP
3 (n=10)	8	6	4	6
5 (n=13)	13	12	13	13
7 (n=12)	12	11	12	12
12 (n=8)	8	8	8	8

expressions, or Determiner *ling6 ngoi6* NPs. Almost all of the children in the 5-, 7- and 12-year-old groups were able to imitate both of these forms. As for the Relative NPs and Demonstrative NPs that could be used for Reintroduction, four to six of the children in the 3-year-old group and all of the children in the 5-, 7-, and 12- year old groups were able to imitate these forms.

The noun phrase and sentence imitation probes were both attempts to determine whether children had knowledge of referring expressions that would allow them to refer adequately in different types of referential functions, particularly in the Introduction and Reintroduction of characters. Across probes, all children in all four age groups, except two of the 3-year-old children, evidenced knowledge of one or the other of the referring expressions that could be used to Introduce a new character to their listener. Likewise, all but four children from the 3-year-old group evidenced knowledge of the Relative NPs and Demonstrative NPs that could be used to Reintroduce a known character to their listener. The noun phrase probe turned out to have limited value since children often used forms that could not be used in the stories, e.g., Locative NP and the NP without head noun.

3.1.6. Referring expressions used to introduce the main protagonist

Although referential adequacy was not rated for Introduction of the main protagonist, referring expressions used were tabulated by age. The findings were in complete harmony with patterns reported in earlier sections. Focusing on the 3-year-olds who had the most difficulty with the Introduction function, it was found that the two children who were not able to imitate Existential presentative expressions in the probe and were not referentially adequate on the Introduction to the second character, also did not use these forms to Introduce the main protagonist.

3.1.7. Comprehension Probe

The comprehension probe was designed to examine whether children could distinguish the two characters that were involved in the stories. Table 3.11 gives the mean (and standard deviation) score for each age group. Recall that scores for this task were the total number correct for two questions about character identity, e.g., "As for reading the newspaper and cooking the vegetables, are they done by the same person?"

Again the 3-year-olds received a low score on this probe, indicating possible difficulties distinguishing the two characters. They often gave a "Yes" response suggesting that they thought it was the same character who was involved in the two actions in the question, when in fact it was not. The 5-, 7-, and 12-year-olds gave an appropriate answer to the two questions almost always.

TABLE 3.11

Mean (and Standard Deviation) Scores for the Comprehension Probe by
ageGroup

Age group	Number correct
3	0.6 (0.8)
5	1.8 (0.4)
7	2.0 (0)
12	2.0 (0)
max. = 2	

3.1.8. The developmental pattern: Summary and Conclusions

The 3-year-old group were minimally able to refer adequately to characters in their stories. They were only successful on the least difficult, Maintenance, function, where they referred to a character who was continuing from the preceding picture. The 5-year-old children were referentially adequate much more often. Some of them were able to refer clearly in the Maintenance and the Introduction functions, and others were additionally adequate on the most difficult Reintroduction function as well. The 7- and 12-year-olds were successful on all three functions. Given their mid-range performance, the 5-year-olds are the most interesting group for looking at the relation between knowledge of linguistic forms and referential success. Could it be that their failure to refer adequately was due to gaps in linguistic knowledge? Though they had only partial success in Introduction and Reintroduction, all of the 5-year-olds demonstrated knowledge of at least one referring expression that could be used for these two referential functions.

A further aspect of development became clear when children's reference was analyzed in two different discourse positions. Excluding the 3-year-olds, whose success in Introduction and Reintroduction was negligible, children in this study were almost always more referentially adequate when the Introduction and Reintroduction functions occurred late rather than early in the discourse.

As is implicit in the referential adequacy scores, children in this study used systematically different forms for reference in the three functions. To Maintain a known character, they used primarily definite forms, i.e., lexical and zero pronouns. To Introduce a second new character, they used primarily indefinite referring expressions, i.e., Existential presentative expressions and Determiner *ling6 ngoi6* 'another' NP. To Reintroduce a known character, they used again primarily definite referring expressions,

i.e., pronoun, Demonstrative NP and Relative NP. For the Introduction and Reintroduction functions, the 7- and 12-year-old children also used forms (i.e., Possessive NP and Proper noun, respectively) that could be considered as definite or indefinite depending on the discourse context.

3.2. THE USE OF REFERENCE IN CHILDREN WITH SLI

The final goal of this study was to examine the development of reference in Cantonese-speaking children with SLI in an effort to explore the language-specific symptoms of this condition. To this end, a group of SLI children was compared to a group of age-matched 5-year-old typically developing Cantonese-speaking children and a group of language-matched 3-year-old typically developing Cantonese-speaking children. As before, each child's stories were scored for referential adequacy in three types of referential functions: Maintenance of a known character, Introduction of a second new character, and Reintroduction of a known character. Forms of referring expressions were noted for each referential act occurring early and late in the discourse.

3.2.1. Referential adequacy: Function

Do Cantonese-speaking children with SLI refer clearly to story characters? Or does this aspect of the language present special challenges? Table 3.12 lists the mean referential adequacy scores (and standard deviation) for each group of children on the three types of functions. Recall that children received credit for referential acts for which at least three of four 'listeners' were able to correctly identify the character. Scores consisted of the percentage of referential opportunities that met this criterion.

TABLE 3.12

Mean (and Standard Deviation) Referential Adequacy Scores by age and Language Group and Referential Function

Group	Referential function			
	Maintenance	Introduction	Reintroduction	Combined
SLI	0.78 (0.27)	0.36 (0.35)	0.06 (0.09)	0.40
LM ^a	0.74 (0.33)	0.22 (0.21)	0.05 (0.07)	0.34
AM ^b	1.0 (0.00)	0.77 (0.10)	0.44 (0.13)	0.74

a. LM^a = Language-matched group. b. AM^b peers = Age-matched group

As seen in Table 3.12, the pattern of performance for the SLI group resembled the language-matched group more than the age-matched group. They were reasonably successful in Maintaining reference but had limited referential success in the Introduction and Reintroduction functions. A two-way mixed-model ANOVA, Group (3) by Function (3), confirmed a main effect of Group, $F(2, 18) = 31.94, p < 0.05$. Post-hoc Scheffe analysis indicated that the 5-year-olds performed significantly better than the 3-year-olds and the SLI children. The SLI children performed slightly better than their 3-year-old language peers, but this difference was not statistically significant.

Consistent with the earlier developmental analysis, children's ability to make clear reference changed with the type of referential function. As is clear in Table 3.12, the SLI children, like children in the other two groups, earned the highest score for Maintenance, followed by Introduction, and Reintroduction of referents. The two-way mixed-model ANOVA, Group (3) by Function (3) also confirmed this main effect of Function, $F(2, 36) = 46.30, p < 0.05$. Posthoc Scheffe analysis indicated that all groups combined, children

received the highest referential adequacy score for the Maintenance function, followed by Introduction and the lowest score for the Reintroduction function. There was no significant interaction effect, $F(4, 36) = 0.80$ $p > 0.05$.

Recall from Chapter Two that the SLI group's nonverbal cognitive skills, as measured by CMMS, were significantly weaker than both the age-matched and the language-matched groups. Since it seemed possible that nonverbal cognitive skills could affect children's ability to make clear reference, the two-way ANOVA, Group (3) by Function (3) was re-run using CMMS scores as a covariate. There were no changes in the pattern of results.

In order to further explore the group findings, an analysis of the pattern of referential adequacy scores across functions was conducted on a child-by-child basis. A cut-off score was set at 50%, and each child received a 'pass' (+) when s/he received a score at or above the cutoff on a given referential function. Based on the order of difficulty for the three functions evident in the grouped data, the following developmental patterns were hypothesized:

	Maintenance	Introduction	Reintroduction
Level 1	-	-	-
Level 2	+	-	-
Level 3	+	+	-
Level 4	+	+	+

Each child was assigned a developmental level according to his/her 'pass/fail' pattern across the three functions. Each of the children in the three groups, except for one child in the SLI group, exhibited one of the four developmental levels. This child received

a 'pass' on the Introduction Function, but a 'fail' on the Maintenance and Reintroduction Function. Table 3.13 indicates the number of children in each group in each level. The exceptional child was assigned into Level 3.

As Table 3.13 shows, in both the SLI and the language-matched 3-year-old groups, over half of the children were at Level 2, showing success in referential adequacy only when Maintaining reference. However, overall the SLI group seemed somewhat more successful than the 3-year-olds, as two more children in this group were at Level 3, the highest level these two groups achieved, and one that overlapped the lower performing 5-year-olds. This group difference was not statistically significant in the grouped analysis, perhaps due in part to the small sample size. Nonparametric (Mann Whitney U) analysis of the child-by-child data indicated that group differences between the 3-year-olds and the children with SLI were likely at an alpha level of 0.12.

TABLE 3.13

Number of Children in each Developmental Level by age and Language Group

Level	Group		
	SLI	Language matched	Age matched
Level 1	0	2	0
Level 2	4	4	0
Level 3	3	1	3
Level 4	0	0	4

3.2.2. Referential adequacy: Discourse position

For the Introduction and Reintroduction functions, reference to characters was made early as well as late in the discourse. Table 3.14 gives the mean (and standard deviation) referential adequacy scores for Introduction and Reintroduction of referents in these two different discourse positions, by group.

Here, the Cantonese-speaking children with SLI seem to resemble their age peers rather than the 3-year-olds, with a moderate tendency to perform better in late contexts. A three-way mixed-model ANOVA, Group (3) X Function (2) X Distance (2), however, yielded a main effect for Distance, $F(1, 18) = 4.75, p < 0.05$, but no significant interactions for this factor. Group and Function effects were reported earlier. When the ANOVA was repeated, incorporating the CMMS score as covariates, there was again no change in the pattern of results.

TABLE 3.14
Mean (and Standard Deviations) Referential Adequacy Scores by age and
Language Group and Discourse Position in Introduction and Reintroduction Functions

Group	Referential function: Discourse position			
	Intro ^a .: Early	Intro.: Late	Reintro ^b .: Early	Reintro.: Late
SLI	0.31 (0.35)	0.46 (0.40)	0.04 (0.10)	0.05 (0.13)
Language-matched	0.23 (0.20)	0.21 (.30)	0.00 (0)	0.10 (0.13)
Age-matched	0.74 (0.14)	0.82 (0.24)	0.40 (0.20)	0.55 (0.19)

a. Intro^a = Introduction. b. Reintro^b = Reintroduction.

3.2.3. Referential adequacy: Linguistic forms

As reviewed in Chapter One, different forms of referring expressions are used to refer to known and new characters. Do Cantonese-speaking children with SLI use systematically different linguistic forms for the three target referential functions, and do their usage patterns more closely resemble those of their age-matched, or their language-matched, peers?

For this analysis, the dominant forms used to achieve referential adequacy for each referential function were identified for each group. Dominant form was defined as a form used by a group in at least 20% of their referentially adequate responses, and used at all by at least three of the seven children in that group. Tables 3.15, 3.16, and 3.17 show the different dominant forms identified for the SLI group and the two control groups in each type of referential function. Frequency of other forms used to achieve referential adequacy can be found in Appendix F.

TABLE 3.15

Dominant Forms for Maintenance of Reference to a Character and
Overall Frequency of use by age and Language Group

Group	Form (% use)	
SLI	pronoun (45%)	zero (21%)
Language-matched	zero (56%)	pronoun (40%)
Age-matched	pronoun (64%)	zero (33%)

For Maintenance of a referent, the same two dominant forms were identified in all three groups. The SLI children, like the typically developing children in both control groups, primarily used definite referring expressions, i.e., lexical and zero pronouns, to achieve referential adequacy in the Maintenance function. They were more like their age peers than like the 3-year-olds in the relative frequency of use for these two forms.

The SLI children, like their language-matched peers, used Existential expressions to Introduce a second character both early and late in the discourse. Both of these groups differed from the 3-year-olds, who used Existential expressions only in the early contexts. In regard to variety of forms used, however, the SLI children resembled their younger, language-matched peers more than their age peers. Existential expressions were the only

TABLE 3.16

Dominant Forms for Introduction of a Character and Overall Frequency of use by age and Language Group

Group	Forms (% use)	
	Early Context	Late Context
SLI	Existential expression (64%)	Existential expression (46%)
Language-matched	Existential expression (38%)	no dominant form
Age-matched	Existential expression (52%) Determiner NP (27%)	Existential expression (78%)

dominant form used for Introduction by the SLI children, while the age-matched controls used Determiner *ling6ngoi6* 'another' NP as well.

For the Reintroduction function, the SLI children again resembled their language-matched peers, in that no dominant forms could be identified for either group. This was primarily due to the fact that most of these children failed to achieve referential adequacy in this function.

3.2.4. Summary

Children with SLI showed the same order of difficulty for the three referential functions as both the age-matched 5-year-olds and language-matched 3-year-olds: Maintenance of a character was the least difficult, followed by Introduction of a second new character, then Reintroduction of a known character. They were also more

TABLE 3.17

Dominant form for Reintroduction of a Referent and Overall Frequency of use by age and Language Group

Group	Form (% use)	
	Early Context	Late Context
SLI	no dominant form	no dominant form
Language-matched	no dominant form	no dominant form
Age-matched	Pronoun (55%)	Demonstrative NP (45%)
	Demonstrative NP (27%)	Relative NP (23%)

referentially adequate when the Introduction came late rather than early in the discourse, and in this respect resembled age-matched peers. The children with SLI were not, however, able to make reference to story characters as well as their age-matched peers and their overall adequacy scores were more like those of the younger controls. There were some indications in the subject-wise analysis that a few children in the SLI group were more successful than the language-matched group as a whole, e.g., showing referential adequacy for both the Maintenance and Introduction functions.

3.2.5. Noun phrase and sentence imitation probes

The noun phrase and sentence imitation probes were given to examine further whether the children had knowledge of the noun phrase types needed for the referential functions. Recall that the noun phrase probe consisted of a “Yes/No” question and a follow up *who*- question. Table 3.18 gives the mean (and standard deviation) score for a “No” response to the first question, e.g., “Was it him/her who scribbled on the paper?” for each group. The majority of the SLI children had no problems with this first question. There was one child who missed one of the four items and another one who gave a wrong answer for three out of the four items. Otherwise, all of the children with SLI were able to say “No” correctly, indicating that it was not the figure staying behind who did the mischievous act. Children’s use of noun phrases for reference in this probe could thus be examined in answers to the follow up question “Then who is it?”

To answer the experimenter’s question, the children across the three groups used a wide range of noun phrases for making reference to the toy figure. This included noun phrases modified by the determiner *ling6 ngoi6* ‘another’, a temporal adverbial *tau4 sin3* ‘just now’ and relative clause. Noun phrases modified by a locative *haa6 min6* ‘under’ or *jap6 min6* ‘inside’ were also common across age groups. These noun phrases often ended

TABLE 3.18

Mean (and Standard Deviation) Score for Correct Response to the First Question
in the noun Phrase Probe by age and Language Group

Group	Number correct
SLI	3.4 (1.1)
Language-matched	3.4 (1.1)
Age-matched	4.0 (0)

max. = 4

with the head noun omitted, which is appropriate in this context of use. Most children used one or two of these different noun phrases consistently for all four items in this probe.

Since the goal of this probe was to find out if children knew the referring expressions needed for reference to characters in stories, the use of Determiner *ling6 ngoi6* NP and Relative NP was analyzed on a child-by-child basis. Determiner *ling6 ngoi6* 'another' NP would make a clear Introduction to the second new character, and Relative NP would make a clear Reintroduction to the protagonist returning to the story. Table 3.19 lists the number of children (out of the pool of 7) who used each of these two forms in each age group. As can be seen, the children with SLI evidenced knowledge of neither of these forms in this probe task.

TABLE 3.19

Number of Children who used Determiner NPs or Relative NPs
in the noun Phrase Probe by age and Language Group

Group	Determiner NP	Relative NP
SLI	none	none
Language-matched	none	2
Age-matched	none	5

In the imitation probe, children with SLI and their age-matched and language-matched peers were asked to repeat nine different sentences and were awarded one point for each exact repetition of the subject noun phrase and referring expression. Table 3.20 gives the mean (and standard deviation) scores for each group.

TABLE 3.20

Mean (and Standard Deviation) Scores for the Imitation Probe
by age and Language Group

Group	Number correct
SLI	2.9 (2.6)
Language-matched	6.0 (1.8)
Age-matched	7.3 (0.8)
max. = 9	

In this sentence imitation probe, Cantonese-speaking children with SLI earned a markedly lower mean score than either the age-matched 5-year-old group or the 3-year-old language-matched group.

The purpose of this task was again to ascertain children's knowledge of referring expressions, i.e., Existential expressions, Relative NP, Determiner *ling6 ngoi6* NP and Demonstrative NP. Both Existential expressions and Determiner *ling6 ngoi6* NP could be used to make a clear Introduction of a second new character; and Relative NPs could be used to make a clear Reintroduction of a protagonist who was returning to the story. Demonstrative NP could be used to either Maintain or Reintroduce a character. Table 3.21 lists the number of children who passed each sentence type from each of the age groups. 'Pass' here is defined as exact repetition of half of the items for that noun phrase type. This would require imitation of at least one Existential expression, one Demonstrative, one Determiner, or two Relative NPs.

TABLE 3.21

Number of Children who used Existential Expressions, Determiner NPs, Relative NPs, or Demonstrative NPs for the Imitation task by age and Language Group (N=7)

Group	Existential ^a	Determiner NP	Relative NP	Demonstrative NP
SLI	4	3	1	1
Language-matched	7	6	3	6
Age-matched	7	7	7	7

a. Existential^a = Existential expression.

There were fewer children in the SLI group than in either one of the control groups who succeeded in imitating any of these noun phrases referring expressions. Only three of the seven children in this group imitated as many as two of the target NP types. A fourth child imitated only the Existential expression. The remaining three children in the SLI group succeeded in imitating none of the forms.

Results from the noun phrase and sentence imitation probe tasks lead to the following conclusions about the SLI children's knowledge of referring expressions. Only four of the seven SLI children versus all of the children in the age-matched and language-matched groups demonstrated the ability to repeat at least one of the forms that could be used for adequate reference in the Introduction function. Only one of the SLI children versus all seven in the age-matched group and three in the language-matched group demonstrated the ability to repeat the Relative NP that could be used for adequate reference in the Reintroduction function. Only one child in the SLI group versus almost all children in the other groups could give an exact repetition of the Demonstrative NP useful for either Maintenance or Reintroduction. At least in these two probe tasks, the SLI evidenced markedly limited knowledge of the referring expressions needed for the referential functions.

3.2.6. Referring expressions used to introduce the main protagonist

Although referential adequacy was not rated for Introduction of the main protagonist, referring expressions used were tabulated by age. The findings were in complete harmony with patterns reported in earlier sections. All of the 5-year-olds successfully imitated the existential expressions in the probe and used them to Introduce the main protagonist as well as the second character. The 3-year-olds were all able to imitate the Existential expressions and the one child who were referentially adequate on the

Introduction to the second character was also the only child who used these forms to Introduce the main protagonist. The three children with SLI who were not able to imitate Existential presentative expressions in the probe and were not referentially adequate on the Introduction to the second character, did not use these forms to Introduce the main protagonist either.

3.2.7. Comprehension probe

The comprehension probe was designed to determine whether children could distinguish the two different characters in the two stories told to them. Table 3.22 gives the mean score for each age group. Recall that the scores for this task were the total number correct for two questions of the form: "As for reading the newspaper and cooking the vegetables, were they done by the same person?"

TABLE 3.22
Mean (and Standard Deviation) Scores for the Comprehension Probe
by age and Language Group

Group	Number correct
SLI	0.9 (0.9)
Language-matched	0.7 (0.8)
Age-matched	1.9 (0.4)
max. =2	

Again the 5-year-old children received almost a full score, giving an appropriate answer to the two questions almost always. In contrast, the SLI children performed essentially at the same level as the 3-year-old language-matched group, failing to demonstrate that they were able to distinguish the two characters in the stories told to them. They often gave a "Yes" response, indicating that it was the same character who was involved in the two actions in the question, when in fact it was not.

3.2.8. The developmental pattern in children with SLI: Summary and conclusions

Similar to the 3-year-old language-matched and 5-year-old age-matched groups, the children with SLI were the most referentially adequate for Maintenance, followed by Introduction, and the least adequate for Reintroduction. Similar to their 5-year-old age-matched peers, the children with SLI were more successful when Introducing a character late rather than early in the discourse. They also used lexical and zero pronouns to Maintain reference, and Existential expressions to Introduce second new characters. These findings speak to the normalcy of the development of reference in Cantonese-speaking children with SLI. Normal orders of acquisition for forms within a language domain have also been reported in English-speaking children with SLI (Leonard, 1998).

The children with SLI were not able to refer to characters in stories as well as their age-matched peers. Their overall adequacy scores were more like those of the younger language-matched controls. Both the 3-year-old language-matched children and the children with SLI were minimally able to refer adequately to characters in their stories. The child-by-child analysis, however, revealed that a few of the SLI children were more successful than their younger peers, succeeding in the Introduction, as well as in the Maintenance function. Even these children, however, failed to imitate forms required at the next developmental level, suggesting a lack of knowledge of these forms.

3.3. SUMMARY OF MAJOR FINDINGS

3.3.1. The development of reference in typically developing children:

1. Maintaining a known character was the least difficult function, followed by Introducing a second new character, and in turn by Reintroducing a known character.
2. The 3-year-old children showed referential adequacy only in the least difficult Maintenance function. Some of the 5-year-old were successful in the Maintenance and the Introduction functions and some in the most difficult Reintroduction functions as well. The 7- and 12-year-old children were referentially adequate in all three functions.
3. Children were more successful when Introducing and Reintroducing a character late rather than early in the discourse.
4. Children used different referring expressions for different referential functions. Indefinite referring expressions were used for the Introduction function. Different definite referring expressions were used for the Maintenance and Reintroduction functions.
5. In probe tasks, the 3- and 5-year-old children, who had little or limited success in Introduction and Reintroduction, did evidence knowledge of referring expressions that could be used for these two referential functions.

3.3.2. The development of reference in children with SLI:

1. In referential adequacy, over half of the children in SLI group were like the language-matched 3-year-old children, only successful when Maintaining a character. The rest were like the age-matched 5-year-old children, successful both when Maintaining and Introducing a character. However, the SLI children demonstrated more difficulty with forms.
2. Children with SLI showed the same order of difficulty across the three functions as the language-matched and age-matched groups. Maintaining a known character was the least difficult, followed by Introduction, and then Reintroduction.
3. Children with SLI were more successful when Introducing a second character late rather than early in the discourse, just like their age-matched peers.
4. Children with SLI used systematically different forms to achieve referential adequacy when Maintaining and Introducing a second character, again just like their age-matched peers. They used definite referring expressions to Maintain a character and indefinite referring expressions to Introduce a second character.

CHAPTER FOUR

DISCUSSION

In this study, Cantonese-speaking children were asked to tell a story from each of sixteen picture books to a blindfolded puppet. In these stories, children's reference to two story characters was examined in three different referential functions: Maintenance of a known character, Introduction of a new character, and Reintroduction of a known character. The sixteen stories were generated from five different templates. The point at which the speaker was to introduce the minor character or to reintroduce the major protagonist varied across templates, some early and some late. A referential act was judged to be adequate when three out of the four native Cantonese speakers independently 'listening' to the stories could successfully identify the character. Children's degree of referential success was determined for different functions and discourse positions, and their referring expressions at various ages were noted.

In this chapter, I will first discuss results from typically developing Cantonese-speaking children, followed by results from Cantonese-speaking children with SLI. These results apply to three specific referential functions, but nevertheless will help us explore the developmental relationship between linguistic and cognitive skills more generally required for reference in discourse.

4.1. TYPICALLY DEVELOPING CANTONESE-SPEAKING CHILDREN

4.1.1. Type of referential functions

The first set of findings from this study concerned developmental changes in referential adequacy in the three different referential functions: Maintenance of reference to

a known character, Introduction of a new character, and Reintroduction of a known character. The typically developing children were from four age groups: 3, 5, 7 and 12 years. With age, children were found to improve in referential adequacy. The older the children, the more able they were to signal to their listener which character they were referring to in their stories. The 3-year-olds were referentially adequate in very few referring acts. The 5-year-olds made clear reference much more often, the 7-year-olds were approaching ceiling, and the 12-year-olds reached near-perfect reference.

Consistent across the age groups, children's ability to refer clearly to the characters in the stories changed with the type of referential function. They were the most referentially adequate with Maintenance, less adequate with Introduction, and the least adequate with Reintroduction.

A child-by-child analysis indicated that the order of difficulty seen in the grouped data was indeed the order of development of referential functions. All children who successfully Introduced a character could also Maintain reference; and all children who successfully Reintroduced a character could also Introduce one. The youngest group of children, the 3-year-olds were referentially adequate primarily in the least difficult, Maintenance, function. The 5-year-olds were split into two subgroups: one was referentially adequate in the Maintenance and Introduction functions, and the other also succeeded in the Reintroduction function. Most of the 7-year-olds and all of the 12-year-olds were referentially adequate in all three functions. The following is a sample story from a child in each age group. The story RIDING A BIKE is one from Template IV, in which the child is required to Maintain and Introduce characters who are "running into a rock" and "making a call," respectively.

A 3-year-old (Subject III 10) version of RIDING A BIKE:

caai2 daan1 ce1

ride bike

'riding a bike'

cong4 can1 go3 sek6 tau4

run-into V-PRT CL rock

'ran into a stone'

dit3 zo2 lok6 seoi2

fall ASP down water

'fell into water'

daai1 din6 waa2

dial phone

'making a call'

dim gaa12 aiu2 daai din6 waa2 gei2

why need dial phone UP

'why is (he) making a call?'

Note that this child's continued use of the zero pronoun in the fourth utterance fails to make adequate reference to the new character who has entered the story. The pertinent picture portrays in the foreground a boy making a phone call at the booth, while the boy who fell off from the bike is in the background.

A 5-year-old (Subject # V 4) version of RIDING A BIKE:

cung4cin4 jau5 go3 naam4 zai2 keoi5 lok6 go3 daan1 cel dok6
once-upon-a-time have CL boy he down CL bike there
'Once upon a time, there was a boy getting on a bike.'

jin4hau6 keoi5 caai2 caai2 haa5 zau6 zing2 dou2 gau6 sek6 tau4
afterwards he ride ride then make V-PRT CL rock
'Then, when he was riding his bike, he ran into a rock.'

jin4hau6 keoi5 zau6 dit3
afterwards he then fall
'Then he fell.'

jin4hau6 (jau5 jat1) ling6 ngoi6 jat1 go3 naam4 zai2 zau6 ngaai3 gau3 wu6 cel
afterwards (have one) another one CL boy then call ambulance
'Then a different boy called an ambulance.'

Unlike the younger child, this 5-year-old successfully Introduced the second character in the fourth utterance, using a Determiner *ling6ngoi6* 'another' NP.

A 7-year-old (Subject # VII 5) version of RIDING A BIKE:

jau5 jat1 go3 naam4 zai2 hai2 dok6 caai2 daan1 cel
have one CL boy here ride bike
'There was a boy riding a bike.'

*go2 go3 naam4 zai2 jat1 go3 m siu2 sam1 gin3 m do2 cin2 min6 jau5 faai3
sek6 tau caai2 zyu6 faai3 sek6 tau4*

that one boy one CL not careful see not V-PRT in front have CL
rock ride V-PRT CL rock

‘That boy wasn’t careful, he didn’t see the rock in front of him and rode on the
rock.’

dit3 dai1 zo2

fall down ASP

‘(He) fell down.’

*gaak3 lei4 (daa1 din6 waa2) daa1 gan2 din6 waa2 go2 go3 jan4 zau6 daa1
din6 waa2 giu3 jan4 bong1 sau2*

nearby (dial phone) dial ASP phone that one person then dial
phone call person help hand

‘The person who was talking on the phone nearby was making a call for help.’

This 7-year-old, like the 5-year-old, referred quite clearly to the second character, who enters the story in picture four. The language used here, is however, more elaborate, as the child used a full relative clause to identify this new character.

A 12-year-old (Subject # XII 1) version of RIDING A BIKE:

jat1 go3 naam4 zai2 hai2 daan1 cel ging3 soeng5 min6 caai2 daan1 cel

have CL boy is cycle path on ride bike

‘There was a boy riding a bike on the cycle path.’

keoi5 m siu3 sam1 zong6 dou2 gau4 sek6 tau4

he not careful run-into V-PRT CL rock

‘He wasn’t careful and ran into a rock.’

gaa3 daan1 ce2 faan2 zo2 keoi5 jik6 dit3 zo2 lok6 dei6

CL bike turn ASP he also fall ASP down ground

‘The bike turned over and he fell on the ground.’

gan1 zyu6 jau5 jat1 go3 lou6 jan4 ging1 gwo3 keoi5 zau6 bong1 keoi5 giu3

bak6 ce2

afterward have one CL passer-by pass by he then help he call
ambulance

‘Then, there was a person passing by and he called an ambulance for help.’

This 12-year-old again clearly Introduced the new character, using an Existential presentative expression, the dominant form for this function.

The following is a sample story from a child in each age group. The second story DANCING, is one from Template II in which the child is required to Introduce and Reintroduce characters who are “playing the piano” and “putting on her ballet shoes,” respectively.

A 3-year-old (Subject # III 1) version of DANCING:

duk6 syu1

read book

‘read a book’

taan4 kam4

play piano

‘play the piano’

zoek6 hai4

put-on shoe

‘put on shoes’

tiu3 mou5

dance

‘dance’

Note that this child’s use of zero pronoun fails to Introduce the new and different character who enters the story in the second picture. His continued use of zero pronoun in the third utterance also fails to make adequate reference to the character who was returning to the story. The pertinent picture portrays in the foreground the girl who was reading earlier now put on her shoes, while the other girl continued to play the piano.

A 5-year-old (Subject # V 1) version of DANCING:

cung4 cin4 le1 zau6 jau5 jat1 go3 neoi5 zai1 hai2 dok6 tai2 gan2 syu1

once-upon-a-time PRT then have one CL girl here read ASP book

‘Once upon a time, there was a girl reading a book.’

gan1 zyu6 ling6 ngoi6 jat1 go3 neoi5 zai1 zau6 hai2 dok6 taan4 gan2 kam4

afterward another one CL girl then here play ASP piano

‘Then a different girl was playing the piano.’

gan1 zyu6 keoi5 zau6 zoek6 deoi3 bal leoi4 mou5 haai4

afterward she then put-on CL ballet shoe

‘Then she put on her ballet shoes.’

gan1 zyu6 keoi5 zau6 hai2 dok6 tiu3 mou5

afterward she then here dance

‘Then she danced.’

Unlike the younger child, this 5-year-old child successfully Introduced the second character in the second utterance. But this child failed to Reintroduce the first character back in the third utterance.

A 7-year-old (Subject # VII 3) version of DANCING:

cung4 cin4 jau5 go3 neoi5 zai1 hai2 dok6 tai2 syul

once-upon-a-time have CL girl here read book

‘Once upon a time, there was a girl reading a book.’

jin4 hau4 jau5 jat1 go3 neoi5 zai1 hai2 dok6 taan4 kam4

afterward have one CL girl here play piano

‘Then, there was a girl playing the piano.’

jin4 hau4 tai2 syul go2 go3 neoi3 zai1 hong4 zo2 le4 zoek6 haai4 tiu3 mou5 la3

afterward read book that CL girl walk ASP here put-on shoe dance PRT

‘Then the girl who was reading walked over and put on her shoes and danced.’

jin4 hau4 keoi5 hai2 dok6 tiu3 mou5

afterward she here dance

‘Then she danced.’

This 7-year-old child Reintroduced the first character clearly when she returns to the story in the third picture. Other 7-year-old children also often used a Relative NP for this function.

A 12-year-old (Subject # XII 2) version of DANCING:

*jau5 jat1 go3 neoi5 zai2 le1 tai2 gan2 jat1 di1 gwaan1 jyul lik6 si2 ge3
syul bun2*

have one CL girl PRT read ASP one CL concerning history L-P
book

‘There is a girl reading some history books.’

*kam2 le1 keoi5 ge3 gal zel zau6 hai1 dok6 taan4 gan2 di1 kam4 hou2
mei5 miu6*

so PRT she POSS sister then here play ASP CL piano very pretty

‘Then her sister is playing some nice music.’

*kam2 go2 go3 neoi5 zai2 le1 zau5 dat6 jin4 zil gaan1 le1 (wun6 zo2) keoi5
zoek6 go2 deoi1 bal leoi4 haai4*

so that CL girl PRT then suddenly PRT (change ASP) she
wear that pair ballet shoes

‘Then that girl suddenly puts on her ballet shoes.’

ceoi4 zoek3 di1 go1 sing1 hai2 dok6tiu3 mou5

follow CL music here dance

‘(She) is dancing to the music.’

This 12-year-old successfully Introduced the second new character in the second picture with a Possessive NP. He also clearly Reintroduced the protagonist back in the third utterance using a Demonstrative NP, a dominant form for this function.

The finding that the adequacy of children’s reference depends upon the particular nature of the referential function is generally consistent with earlier studies focusing on the contrastive use of referring expressions for marking known and new referents in stories. Children were able to use an appropriate definite referring expression for second or subsequent mention of a known character earlier and at a higher percentage, than they were able to use an appropriate indefinite expression for first mention of a new character (Clancy, 1992; Emslie & Stevenson, 1981; Hickmann & Liang 1990; Warden, 1976; Wong, 1998). In most of these studies, second or subsequent mention of a known character was not further differentiated into Maintenance and Reintroduction functions.

Clancy (1992), as in the present study, examined Maintenance, Introduction and Reintroduction as three different referential functions. She found that Japanese-speaking children used ellipsis to Maintain a character, and contrastively, nominal forms to Introduce and Reintroduce a character. However, her results were not exactly the same as the results reported here. Based on the percentage of nominals used for each function relative to that of adult speakers, Clancy did find Maintenance to be the easiest function for her Japanese-speaking subjects. But she concluded that it was Introduction, instead of Reintroduction, that was the most difficult. This conclusion was based on the fact that two of the youngest groups of children used the nominal form at levels significantly lower than adults for

Introduction, whereas only the youngest group used nominals at levels significantly lower than adults for Reintroduction. However, even though the nominal form is required for the Reintroduction function, it is apparently not obligatory. In the two narrative tasks, adult Japanese speakers used predominantly ellipsis to Reintroduce the character (at 57% and 82%). The use of ellipsis to Reintroduce a character is acceptable in Japanese because there are features in the language, e.g., specific conjunctions, that help disambiguate the reference (Clancy, 1992). The acceptability of both nominal and ellipsis might account for the early development of the Reintroduction function in Japanese children.

What might account for the developmental differences seen in performance on various referential functions? To conclude their study of language development in the context of narratives, Berman and Slobin (1994) proposed that “‘being a proficient speaker’ requires fully integrated knowledge of the **overall** [bold in original] resources of the linguistic system and the cognitive ability to maintain a fully updated representation of the **listener’s** [bold in original] current state of knowledge” (p. 598). We will explore how linguistic and presuppositional skills might affect the development of reference in the four age groups we included in this study, particularly in the 3- and the 5-year-old groups, in which performance was not yet at ceiling.

Let’s first examine linguistic knowledge. To Maintain a character, adult Cantonese grammar indicates that either a lexical pronoun, a zero pronoun, or a Demonstrative NP can be used. To Introduce a second character, an existential or a Determiner *ling6 ngoi6* ‘another’ NP can be used. To Reintroduce a character, a Relative NP or Demonstrative NP can be used. In this study, an independent assessment of children’s knowledge of referring expressions for use in these functions was drawn from performance on a sentence imitation task. Elicited imitation has generally been found to be a reliable way to examine children’s linguistic knowledge since the time when Brown (1973) demonstrated that children modify

sentences they were asked to imitate in ways that closely resemble their own spontaneous productions. It continues to be advocated for use these days (Gerken, 2000).

All age groups were referentially adequate on the Maintenance function. This indicated that most children in this study were able to use the referring expressions needed for that function, notably lexical and zero pronouns. However, the 3-year-olds, and many of the 5-year-olds, were not referentially adequate on the Introduction and/or the Reintroduction functions. Results from the imitation probe indicated that eight of the ten 3-year-old children and all of the 5-year-old children evidenced knowledge of at least one of the referring expressions that can be used for the Introduction function. Six of the ten 3-year-old children and all of the 5-year-old children evidenced knowledge of at least one of the referring expressions that can be used for the Reintroduction function. These children were, nevertheless, not able to refer with consistent adequacy when a new character came in to the story or a known character returned to the story.

Since linguistic knowledge cannot provide an adequate account for the developmental changes observed here, we need to consider again the cognitive demands of making presuppositions for reference. Even if a child knows the requisite form, s/he will not succeed in using it as a referring expression unless s/he can also make the necessary judgments about the listener's knowledge. Here are the hypothetical processes involved in presupposition making, as developed from Levelt's (1989) framework:

1. Construction of a mental representation of the discourse

Each discourse participant creates a mental representation of the discourse, which consists of his knowledge of the entities, their relations and properties, as well as what is known about the knowledge of the other participant(s). Levelt describes how the adult

speaker integrates his knowledge of the other participant(s) into his own discourse representation,⁸ incorporating judgments about knowledge components and attentional status. An individual then uses his discourse representation to structure his message when speaking and to interpret utterances when listening. The construction of a discourse representation becomes necessary as children begin to engage in connected discourse about entities not physically present and about past as well as future events. Such representation is increasingly used as a frame of reference instead of the external physical environment as young children comprehend (Bishop, 1998), and produce language (Bloom, 1991; Lahey & Bloom, 1994).

2. Updating the discourse representation after each utterance

Each utterance that is spoken changes the listener's knowledge of the referents. Entities that were new now become known, and entities that were known but not mentioned in the last utterance become one degree 'less known'. These changes in knowledge can be understood as changes in the attentional focus of the listener, that is in the activation level of the entities in the listener's discourse model (Dryer, 1996). The changes may also involve 'movements' of referents among the knowledge components (Levelt, 1989) of this representation. The speaker needs to update his own discourse representation to reflect the changes in the listener's knowledge. He has to relocate any entities that were mentioned in the last utterance, i.e., from the knowledge-the speaker-intends-to-convey component to the discourse model as shared-knowledge-contributed-by-self, and to increase or reduce the degree of the listener's attentional focus to entities in his discourse representation. This process may require revision of all of entities' attentional

⁸ Recall that here **discourse representation** refers to an individual's entire representation of the discourse, which includes the four knowledge components as discussed in Levelt (1989): common-ground-knowledge, knowledge-the-speaker-intends-to-convey, shared-knowledge-contributed-by-self, and shared-

status in an ongoing fashion (Dryer, 1996), which could become an increasingly demanding function as the discourse model accumulates information.

3. Making presuppositions before an utterance

Before he encodes his message into an utterance, the speaker consults his discourse representation, and he checks the character he will refer to for its knowledge 'location' and attentional status. The speaker then makes a presupposition about his listener's knowledge of this character, which he will use as a basis for his choice of a referring expression, a choice that will allow the listener to identify the character.

If the speaker intends to talk about a character that has just been relocated in his discourse model, and/or with the highest degree of attentional focus, he makes the presupposition that the speaker knows the character and is attending to it. He will then choose a referring expression that Maintains reference to the character. If instead, the speaker finds that the intended character is *not* in his discourse model, he makes the presupposition that the listener does not know the character and it is therefore new to her. He will further identify the new referent as either common knowledge or brandnew, and will then choose a referring expression that Introduces the character to the listener. Finally, if the speaker finds that the character *is* in his discourse model, but is not the one talked about in his last utterance, he makes the presupposition that the listener knows the character, but is not attending to it. He will then choose a referring expression that Reintroduces the character to the listener.

Marslen-Wilson, Levy and Tyler (1982) argue that the speaker and the listener each “maintain a constantly developing mental representation of the current discourse, and the communicative success of an utterance largely depends on the extent to which the appropriate linkages can be established between the utterance and this discourse representation” (p. 339). In a developmental context, we must add that success depends on the extent to which the discourse representation is created, updated, and consulted. A child may fail to make appropriate presupposition due to a failure to

- 1) construct a discourse representation in the first place,
- 2) accurately update the discourse representation after each utterance, or
- 3) consult the discourse representation

How does this theoretical understanding of presupposition skill as cognitive process help us understand the developmental patterns of reference? The 7- and 12-year-olds succeeded in all three referential functions and they must have each of these capabilities. Consider, however, the 3- and 5-year-olds. Recall that the 3-year-olds were referentially adequate only on the Maintenance function. They were not referentially adequate on the Introduction and Reintroduction functions, even though 80% and 60% of the children demonstrated knowledge of these forms needed for the functions, respectively. One possible explanation for this fact is that those children who knew the forms may have been having difficulty with the cognitive processes involved in making presupposition when Introducing and Reintroducing characters. These 3-year-old children consistently referred to a character as if it were the same as was talked about in the last utterance, regardless of the fact that the character could be new, or could be one the listener was not attending to at the moment. This pattern of reference suggests that they were not updating their discourse representation to reflect changes in the listener’s knowledge as the discourse evolved, or alternatively, that they were not even constructing and maintaining a discourse

representation. Failure to create or maintain a discourse representation would certainly preclude appropriate presupposition.

This explanation is consistent with findings from Peterson's (1990) study of children's personal narratives of past events that were unfamiliar to the researcher. The children ages 2;0 to 3;6 tended to refer most often (48%) to the people they knew, including their family members. When they talked about nonfamily members, people the researcher did not know, they introduced them only 13% of the time. Eighty-seven percent of the time they did not specify who these people were. They used pronouns or common names that did not lead to the listener's identification of the individuals. These data suggest again that 3-year-old children do not have a discourse representation that allows them to make presuppositions about their listener's knowledge.

How then could success on the Maintenance function be explained? Perhaps, the 3-year-olds' 'adequate' use of zero pronouns was accomplished by making reference on the basis of only their own, but not the listener's, knowledge about the characters. Since they knew the character being talked about, they used a zero pronoun in Maintenance and all discourse contexts. This usage was consistent with the 'expert' listener's expectation that the character was known and thus led to ratings of adequacy in the Maintenance function, but not the other two referential functions.

An alternative explanation for the 3-year-olds' low rates of referential adequacy might be that the 3-year-olds had difficulty interpreting the pictures and understanding how one picture leads to the next in the stories. Recall the RIDING A BIKE story told by a 3-year-old reported in Section 1.1. Apparently, the child was drawn to the new character by noticing what he was doing. His remark at the end "why is (he) making a call," however, indicated that he failed to understand how the different actions he described were related to

one another to make up a meaningful story. This explanation is consistent with findings from studies using pictures to elicit narratives from 3-year-old children learning diverse languages (Berman & Slobin, 1994). It would not, however, explain the pattern of success and failure in the various functions.

The 5-year-olds showed one of the two patterns of reference. One subgroup of the 5-year-old children showed success in referential adequacy in all three functions, indicating the combination of linguistic knowledge and presupposition skills required for each type. They were able to construct a discourse representation that incorporates knowledge of the listener, to update it in terms of both knowledge components and attentional status, and to make appropriate presuppositions about the intended referent based on their discourse representation. The other subgroup showed referential adequacy when Introducing and Maintaining characters, but they were not referentially adequate when Reintroducing characters even though they demonstrated knowledge of the forms needed to do so. A sample story DANCING from a 5-year-old from this subgroup was presented earlier.

Again, one explanation for this pattern is that these children were having difficulty with the processes involved in making presupposition when Reintroducing characters. Given that they can Maintain and Introduce characters adequately, they seem able to construct, and consult with, a discourse representation that incorporates the knowledge of the listener. This leads us to focus on the nature of the judgments needed and on the updating process. The presuppositions underlying Reintroduction may be particularly demanding since they involve (1) judgments of the listener's *relative* attentional focus on the characters in the discourse, and (2) ongoing adjustment of the attentional status of *all* characters in the model. The intended referent is already in the discourse model, but the child must decide whether it is a character that has just been mentioned and thus is in the listener's attentional focus, or is a character that was mentioned in an earlier utterance and

thus is less focused. Difficulty with either the relative judgment or the updating could lead to an inappropriate presupposition and ultimately to inadequate reference.

An alternative explanation might be that these 5-year-olds were actually able to make the presuppositions necessary for the Reintroduction function, but had difficulty with the mapping of the presuppositions and the linguistic forms they had available for successful reference. This remains a viable explanation until procedures to examine presupposition independent of the use of language are developed.

4.1.2. Discourse positions

The second set of findings from this study concerns the effect of discourse position on reference. The data indicate that the ability to refer clearly to characters in short stories changes with the discourse position of the referential function. Children were more referentially adequate late rather than early in discourse on a given referential function, i.e., Introduction or Reintroduction.

It was initially hypothesized that children would be less, not more, referentially adequate in functions towards the end of the discourse. As the discourse evolves, there would be an accumulation of referents and predications in the speaker's discourse representation. Updating the character in terms of knowledge components and attentional status in his discourse representation would hence become a more complex task for the speaker and more vulnerable to error, resulting in inaccurate presupposition. This hypothesis did not bear out, at least not in this study where stories were simple by design. Children were actually more successful with Introduction or Reintroduction of a character when the referential act occurred late rather than early in the discourse.

One possible explanation for this finding appeals to the relative saliency of a character change later in the discourse. Let's examine how this factor might account for the discourse position effect for the Introduction and the Reintroduction functions individually. Recall that except for the Template 1 stories, all stories contained two characters. In the early Introduction function, the child must refer to the new character right after the protagonist has been introduced. However, in the late Introduction function, the child does not refer to the new character until he has been Maintaining reference to the protagonist for several story scenes. Utterance after utterance, the child finds no need to change his discourse representation, as the just mentioned referent is already in his discourse model and in the listener's attentional focus. This extended history of no-change undoubtedly highlights the differences created by the arrival of a new character. The child's attention is drawn to the detail of his discourse representation and successful presupposition is facilitated. Alternatively, the highlighting captures the child's attention and it is his own renewed interest in the character that supports the fuller reference rather than any appreciation of the listener's need. This explanation finds supports in studies which examined which element of a speaking situation that young children will encode in their utterances. Results indicate that children are more likely to encode the changing and hence more informative elements in the environment that draw their interest (Greenfield & Westerman, 1978; Greenfield & Zukow, 1978).

A similar saliency explanation could apply to the Reintroduction function. In the early Reintroduction function, the child must refer again to the known protagonist right after the second character has been introduced. However, in the late Reintroduction function, the child must refer to the original protagonist after he has been Maintaining reference to a second character for several story scenes. After each utterance, the child updates his discourse representation. He does not need to make any changes in the second character as it is already in his discourse model and remains in the listener's attentional

focus. He does need to constantly reduce the listener's attentional focus on the original protagonist since this character has not been referred to again as the discourse proceeds. This extended history of no change in the second character creates an increasingly salient discrepancy in the degree of attentional focus between the second character and the original protagonist. Again, this discrepancy could highlight the need to explicitly Reintroduce the protagonist when that character finally does reappear, or could engage the child's own interest sufficiently to support fuller reference.

This study reports for the first time that children's ability to make clear reference to characters is affected by the discourse positions in which a referential act is required. Given that we structure our messages based on our representation of the discourse and that complex cognitive processes are involved in the management of the changes in these representations as the discourse evolves, it is not surprising that the context in which a particular referential act occurs can affect success. What is surprising about these findings is that the expected effects of the later position, i.e., less available working memory space and greater opportunity for error, were apparently overridden by a saliency effect. Whether this saliency effect reflects the discourse model or merely the speaker's own attentional state remains to be determined.

4.1.3. Forms for adequate reference

The third set of findings concerns the forms of referring expressions used for the different referential functions. The dominant forms of referring expressions used in at least 20% of the referentially adequate acts by at least half of each age group of children were identified. The first finding was that children used different dominant expressions for the three different referential functions. Across the age groups, indefinite referring expressions were used to Introduce a new character, and definite referring expressions were used to

Maintain and to Reintroduce a character. However different types of definite referring expressions were used for the Maintenance and Reintroduction functions. Children used zero and lexical pronouns, e.g., *keoi6* 'she/he' to Maintain a character; and Existential presentative expressions, e.g., *jau5 jat1 go3 naam4 zai2* (have one CL boy; 'there is a boy'), Possessive NPs, e.g., *naam4 zai2 go3 pang4 jau5* (boy CL friend; 'the boy's friend') and Determiner *ling6 ngoi6* 'another' NPs, e.g., *ling6 ngoi6 jat1 go3 naam4 zai2* (another one CL boy; 'a different boy') to Introduce a character. Reintroduction was accomplished with pronouns, Demonstrative NPs, e.g., *go2 go3 naam4 zai2* (that CL boy; 'that boy'), Relative NPs, e.g., *sik6 jyun4 je5 go3 neoi5 zai2* (eat VP things CL girl; 'the girl who has finished eating') or Proper nouns, e.g., *aa3-jin1*. This contrastive use of definite and indefinite referring expressions across the three functions was first seen in the 5-year-old children, a result that is consistent with prior studies by Clancy (1992) with Japanese speakers; Wong (1998) with Cantonese Chinese speakers; and Hickmann and Liang (1990) with Mandarin Chinese speakers.

The second finding was that there was a tendency for the older children to use pronominal forms for Maintenance and nominal forms for Introduction and Reintroduction. However, pronouns were also used for Reintroduction as well. A similar pattern has been reported in studies which examined the contrastive use of the pronominal and nominal forms for maintaining and switching referents. Children between the ages of 3 and 9 (Bamberg, 1987; Gomme and Johnson, 1997; Karmiloff-Smith, 1981) were found to use pronouns to switch reference to the thematic subject (or main protagonist), but for minor characters, they used primarily nominals for this task. The use of this 'thematic subject' strategy was interpreted as an attempt of young children to organize their discourse. In this study, the older children's use of pronouns to switch reference to the major protagonist may be further evidence of use of the 'thematic subject' strategy. However, since Reintroductions here only involved the protagonist, this would need to be confirmed with

data from stories where there were also Reintroductions of a minor character. Such confirmation would suggest that children's choice of referring expressions for characters was not only guided by their presupposition of the listener's knowledge, but also by the organizational scheme of the story they were going to tell.

The third finding about forms was that there was a tendency for the older children to use more different forms to achieve referential adequacy. The use of Possessive NPs for Introduction and proper names for Reintroduction was only noted for the 7- and 12-year-old children. Proper nouns are not linguistically complex in form, and Possessive NPs were reported in Cantonese-speaking children at as early as age 5 (Fletcher et al., 2000). Both Proper nouns and Possessive NPs would be appropriate for all three types of referential functions. However, the use of a Proper noun or a Possessive NP for reference in discourse implicates story-telling strategies that require exposure to literacy. To use a proper noun for a character, the child has to name the character and then to refer to him/her with this name consistently. To use a possessive NP, the child has to make up a relationship between the characters. This might explain why these two forms of referring expression were not used by the younger children in this study.

4.1.4. Conclusion

To summarize, this study examined the development of reference in the discourse of young children, discourse not as a completed activity, but as an ongoing process of narrative production. This study is an extension of earlier research that examined the contrastive use of referring expressions for reference to new and known characters in stories. In those studies, all instances of the referential acts were first identified, and then the form of referring expression used for each act was noted and compared against expectations based on the adult pattern of use. For example, the percentage of use of

indefinite expressions for Introduction of a new character would be calculated and a high score would be considered as evidence of mastery of the function. These studies contributed to our understanding of developmental changes, but were primarily presented in a descriptive fashion with little attempt to relate the findings to theoretical constructs that could explain the developmental changes.

In this study, a potentially explanatory framework for the development of reference was developed from an understanding of presupposition that is built on notions of discourse representation, discourse model, and attentional states. Each referential act is seen as requiring the speaker to select a linguistic form that is appropriate given his presupposition about the listener's knowledge state at that moment of discourse. Making these presuppositions involves a number of cognitive processes, including the creation and updating of a discourse model, judgments about the listener's relative attentional focus, and judgments about common knowledge. The resultant developmental interaction of linguistic and presuppositional skills was investigated by examining performance in three referential functions by children at four ages. Patterns of success and failure in various referential functions pointed to children's difficulty with specific aspects of presupposition. The developmental picture turned out to be a complex one. The cognitive framework was generally able to provide an explanatory account of the findings, but ultimately a wider range of factors was needed to describe and explain how a child will refer to a particular character in a story. In addition to the child speaker's knowledge of the linguistic forms and his ability to make accurate presupposition of the listener's knowledge as the discourse evolves, his exposure to literacy, the thematic role of the character, the discourse position of the referential act, and his own attentional state were seen to be possible determinants of the observed pattern of reference.

4.2. CANTONESE-SPEAKING CHILDREN WITH SLI

Seven 5-year-old Cantonese-speaking children with SLI were matched with two groups of Cantonese-speaking children who were typically developing: one group by age, and the other by expressive language level. The language-matched children were 3 years old, on average one-and-a-half years younger than the SLI children. This matching strategy is often used in research with children with SLI to explore exceptional areas of learning difficulty. Given that they are language impaired, the language performance of children with SLI is expected to be lower than children of the same age. However, if research reveals aspects of language performance that are lower than that seen in children at generally comparable levels of language ability, these aspects can be viewed as areas of special vulnerability. English-speaking children with SLI have been consistently reported to demonstrate more errors with a selected number of grammatical morphemes than children at the same language level (see Leonard, 1998 for a comprehensive review). This fact has proven to be clinically useful as a diagnostic symptom, and scientifically useful as a guide to the nature of SLI. Many aspects of Cantonese are different from English, its lack of inflectional morphemes for one. As discussed in Chapter One, the use of subject noun phrases for reference to entities is often optional in Cantonese, and is more likely to be determined by semantic and discourse variables rather than syntax, making adequate reference in discourse seem to be an area where exceptional difficulty for children with SLI might exist. The matching strategy employed here allows us to explore this possibility.

Findings from this study indicate that children with SLI showed the same general pattern of development of reference as the two groups of typically developing children. Children with SLI demonstrated the same order of difficulty for the three referential functions. They received the highest referential adequacy scores on the Maintenance function, mid-range scores for Introduction, and the lowest scores on the Reintroduction

function. They also received higher referential adequacy scores for the Introduction and the Reintroduction functions when they occurred later rather than earlier in the discourse. As a group, in all referential functions, children with SLI demonstrated referential adequacy at levels much like those of the 3-year-old language-matched children, rather than the 5-year-old age-matched children. This general finding suggests that referential adequacy requires communicative experience with language, and that age and its conceptual correlates alone do not provide a sufficient foundation. However, further subjectwise analysis revealed that not all of the SLI children were at the same developmental levels as the 3-year-old language-matched children. There were two subgroups in the children with SLI, and their development will be discussed separately in the following paragraphs.

Three children with SLI were actually at the same developmental level as the 5-year-old age-matched children, their age peers. They were referentially adequate in two functions, Maintenance and Introduction. These children used the existential presentative expression appropriately to Introduce a character and were among the few who showed knowledge of this expression in the imitation probe. Like some of the 5-year-olds discussed earlier, this subgroup of children with SLI were not able to adequately Reintroduce a known character. However, the SLI children performed differently than the typical 5-year-olds on the imitation probe. The 5-year-old children were able to imitate the Relative NP and the Demonstrative NP needed for the Reintroduction of a known character, and they used them occasionally in the referential function. In contrast, two of the three children in the advanced SLI subgroup were not able to imitate even one of the referring expressions needed for Reintroduction and did not use these forms at all.

Are these children with SLI then like their 5-year-old age-matched peers? Recall that despite a history of specific language impairment, by the time of this study, all of the children in the SLI group performed within the normal limits on the Expressive scale of the

Reynell, and three of them were also within the normal limits on the Receptive scale of the Reynell. Interestingly, it was just these three children who were at the same developmental level on reference as their typically developing age peers. Despite this similarity though, these children with SLI showed less knowledge of the linguistic forms required for Reintroducing a character, the referential function at the next developmental level. This pattern of age appropriate performance on the standardized language test on the one hand, and inadequate linguistic knowledge for specific communication tasks on the other, may indicate that the Reynell is not a sensitive measure of the language abilities of at least some of the 5-year-old children with SLI. Support for this possibility comes from Dunn, Flax, Sliwinski, and Aram (1996) who found that standardized psychometric tests in general were less sensitive in the identification of the children with SLI than measures based on children's spontaneous language.

Thus argued, these three children with SLI are not like their 5-year-old age-matched peers. Despite equivalent referential adequacy, the SLI and the typically developing children demonstrate different learning needs. The typically developing children have knowledge of the referring expressions needed for the function, but have to learn to make accurate presuppositions about the listener's knowledge, particularly the changes in her attentional focus as the discourse evolves. The SLI children, on the other hand, have yet to learn the referring expressions needed for the function. And if the forms are prerequisite to the function, the SLI children probably also have yet to learn how to make presupposition about the listener's attentional status, although the data remain ambiguous on this point.

Now let's turn to the other subgroup of children with SLI. Subjectwise analysis revealed that four of the children with SLI actually showed the same patterns of reference as the 3-year-old language-matched children. These children could Maintain a character clearly but failed on the Introduction function. Like the 3-year-olds, their reference could

be guided by their own knowledge, but not the listener's knowledge, of the characters. However, even if their success on Maintenance was real, the imitation probe again revealed further differences in performance. While all of the typically developing 3-year-old children were able to imitate at least one of the forms of referring expression needed for Introduction, only one child with SLI was able to do so. This child, like the 3-year-old language-matched children, demonstrated knowledge of the referring expressions needed, but apparently did not construct or maintain a representation of the discourse which incorporates the listener's knowledge as the discourse evolves. The other three SLI children demonstrated difficulty with the referring expressions and thus their presupposition skill cannot be ascertained.

Recall that as a group, the SLI and the 3-year-old children were matched on their expressive scores on the Reynell. Despite the matching, at least some of the SLI children showed less knowledge of referring expressions for referential functions than their language peers. This was possible, despite matching, because the Reynell expressive score is a sum of the scores from three areas: content, vocabulary, and structure, where structure examines language forms at the sentence level. In other words, the Reynell does not measure the specific language forms that are pertinent to referential acts, which this study was designed to examine.

Returning then to the question that motivated this part of the study: Is making clear reference in discourse an area of exceptional difficulty for Cantonese-speaking children with SLI? Results from three children from the group of seven seem to indicate yes. As was true for the 3-year-old children, it seemed that these children could Maintain a character clearly but failed on the Introduction function. There are two possible explanations for this finding, one of which is unique to this group. First, it is possible that children with SLI were not able to make presuppositions. They did not have the cognitive skills necessary to

incorporate and update the listener's knowledge into a representation of the discourse, on which reference should be based. However, unlike the 3-year-old language-matched children, they did not demonstrate knowledge of the referring expressions needed to introduce a character. This raises the second, and unique, possibility that the nature of the referring expressions required for success in reference posed an exceptional difficulty for these children. For example, Determiner *ling6 ngoi6* 'another' NPs and Possessive NPs, which can be used to introduce a new character, require embedding of propositional meanings. Studies on English-speaking children with SLI report that such children have more difficulties combining multiple meaning units into a formal sentence than normally developing children at the same language levels (Gillam & Johnston, 1992; Kamhi & Johnston, 1992). If success in new referential functions required knowledge of linguistic forms, it is not surprising that these Cantonese-speaking children with SLI would be slow in their development of reference.

Recall that in Chapter One, it was hypothesized that reference in discourse would be difficult for Cantonese-speaking children with SLI as a result of their limitations in processing listener's knowledge over large units of discourse. However, since the speaker's cognitive processing of listener's knowledge cannot be determined independent of linguistic forms, the lack of forms in the group of SLI children in this study does not allow us to determine if the processing deficits account is a viable explanation of their difficulties in discourse referencing.

4.3. LIMITATIONS OF THE STUDY

While it is acknowledged that the present study contributes to our understanding of the development of reference in Cantonese-speaking children, it is instructive to identify limitations which might constrain its interpretations.

The first set of limitations are related to the scope of the study. In this project, children's development of reference was measured by a referential adequacy score that was derived from the expert 'listeners' responses to questions that only related to the identity of the characters. It would have also been possible to have the expert 'listeners' make judgments about the appropriateness of the linguistic form used for each targeted referential act as well as its functional adequacy. This would have provided further developmental information, identifying perhaps stages where the child is referentially adequate but has not mastered adult forms of expression.

The second limitation in scope concerns the communicative functions. The 16 stories in this study were designed to examine children's referential adequacy on only three functions. Other stories could have been included to examine more different referential functions, such as Reintroduction and Maintenance of the minor characters. This would have provided a more detailed picture of the children's development of reference, and allowed for a wider analysis of the effects of discourse position.

Limitations also result from the nature of the experimental task. The design of the stories was intended to provide a simple event context for a short connected discourse, in which reference was examined. Though they did elicit the targeted referential acts, the stories may have been too short for the younger children. These stories did not elicit as many uses of pronouns or other referring expressions in the 3-year-old children as in the other studies in which the longer and more elaborate story *Frog, Where are you?* (Mayer, 1969) (e.g., Bamberg, 1987) was used. The use of longer stories might provide more background information for the children to make sense of the events and hence result in higher productivity of referring expressions. The 3-year-olds also were minimally able to refer adequately to characters in their stories. This would suggest that they had difficulty taking into account of their listener's knowledge. It is also possible, however, that these

children were just not able to attribute knowledge states to the inanimate puppet who was 'listening' to their stories. Replication of the study with the use of a live listener would help to rule out this possibility.

Regardless of the length of the stories or their pretense, the narrative task may have presented one further challenge. Cantonese-speaking children's ability to make adequate reference to characters might have been affected by their prior exposure to story reading activities. A self-report questionnaire study indicated that Chinese mothers in Vancouver read to their children less often than mothers from the Western culture (Wong & Johnston, 1998). Information on the extent of exposure to story reading might help to identify social-cultural factors that influenced the performance of these children. Further studies will be needed to identify the extent to which the developmental picture indicated by this study reflects the use of a book-based storytelling task.

Limitations of a different sort arise from the noun phrase probe tasks. These supplementary tasks did not contribute to the interpretation of the results as much as was planned. Unexpectedly, the noun phrase probe primarily elicited use of noun phrases that were not appropriate to either one of the referential functions investigated. The fact that the mischievous figures left the scene and hid under the table seemed to draw most of the children's attention, and hence encouraged them to refer to the figures by their location. Modifications that would focus the children's attention to features of the figures would be needed to elicit use of referring expressions for the targeted referential functions. The fact that the noun phrase probe task yielded little useful data led to an over reliance on data from the imitation task. This task had not been designed to stand alone and involved fewer forms than were ultimately needed. Finally, the comprehension probe was intended to examine whether the children could distinguish the two characters that were involved in the stories. The 3-year-old children as well as the children with SLI performed poorly on this

probe. The formal complexity of the question and its cognitive demands may have made it difficult for children to demonstrate whether they could distinguish the two characters. The probe required the children to recall from memory the two characters who were involved in the actions mentioned in the question and make a same/different comparison. A different task might have yielded a different picture of competence.

Finally, the success of the SLI component of this study was compromised by sampling problems. The identification of Cantonese-speaking with SLI is a clear challenge for researchers for several reasons. There is a limited number of valid standardized psychometric language measures available, particularly for children at their late preschool years. The seven 5-year-old children with SLI who participated in the study were first identified as such a year prior to this study. By the time of the study, however, four of these children were already within the normal range on the Reynell, the only general test of language that has been standardized on Cantonese-speaking children in Hong Kong. It is not clear whether this reflects language disorders that actually resolved, or some limitation in the assessment tool. Unfortunately, there is a lack of empirically validated developmental measures in Cantonese that are developed from spontaneous language samples of children. The description of developmental changes in terms of measures such as mean length of utterance and total number of different words (Fletcher, Leung, Stokes, & Weizman, 2000), will pave the way for further studies of SLI that may assist interpretation of the present findings.

4.4. FUTURE DIRECTIONS

Making adequate reference requires more than knowledge of linguistic forms. Different types of referential functions and different discourse positions require specific aspects of presupposition. The development of reference is marked by children acquiring

the cognitive skills needed for these different aspects of presupposition. The cognitive processes that are involved in the different aspects of presupposition are not well understood. There is no independent evidence of these processes except through the use of linguistic forms. Future research challenges will be to explore procedures for examining these cognitive processes in nonverbal tasks.

In addition to linguistic and presuppositional skills, the development of reference is also supported by other factors, which include exposure to literacy and the thematic role of the character to be referred to, and the speaker's own attentional states. The extent to which these factors interact with the development of the linguistic and presuppositional skills for reference will be a topic for future research.

Whether reference is a specific area of vulnerability for Cantonese-speaking with SLI remains a question to be further investigated. In spite of its limitation in sample size, results of this study seem to indicate that at least some Cantonese-speaking children with SLI have particular difficulties with adequate reference in discourse when compared to language-matched peers. It cannot be determined, however, whether their difficulty with reference reflects problems with language alone, or with the cognitive processes involved in presupposition as well. Children with SLI do demonstrate deficits on a variety of nonverbal cognitive tasks with processing implications (e.g., Johnston & Ellis Weismer, 1983; see Bishop, 1992; Johnston, 1988, Leonard, 1998, for reviews). Again, future research will require examination of these cognitive processes independent of language forms to ascertain the plausibility of a cognitive explanation for inadequate reference.

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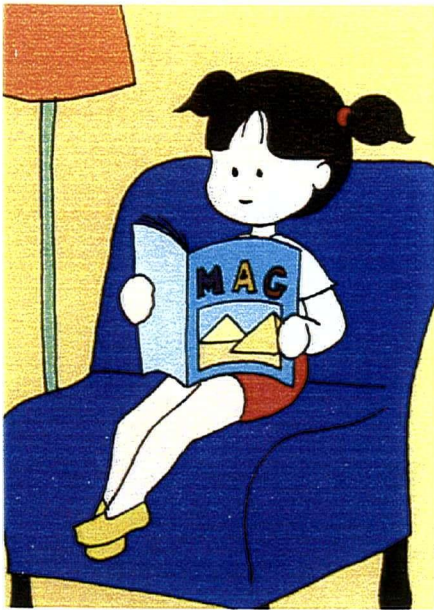
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APPENDIX A: Pictures for the story DANCING from Template II

1



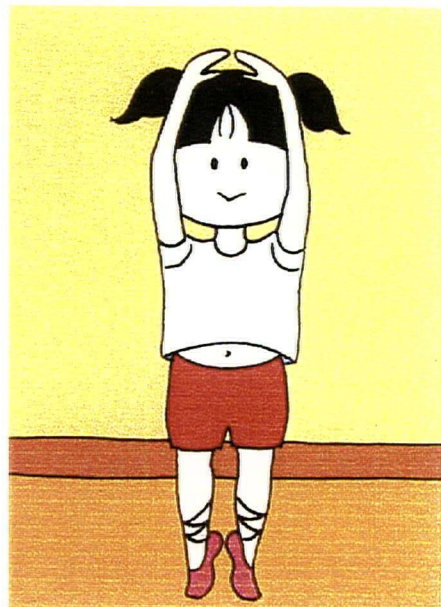
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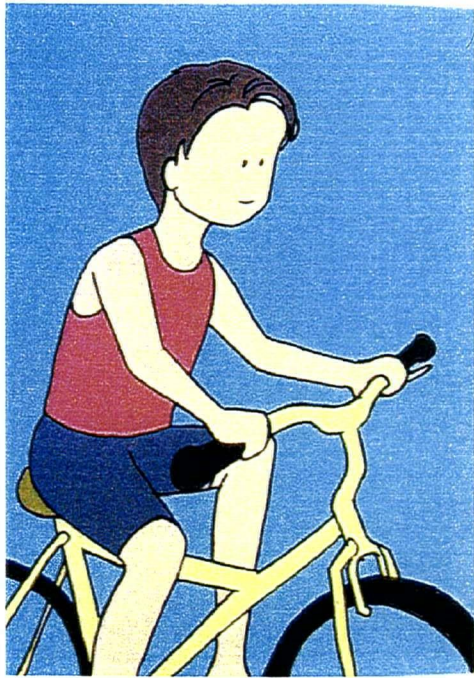


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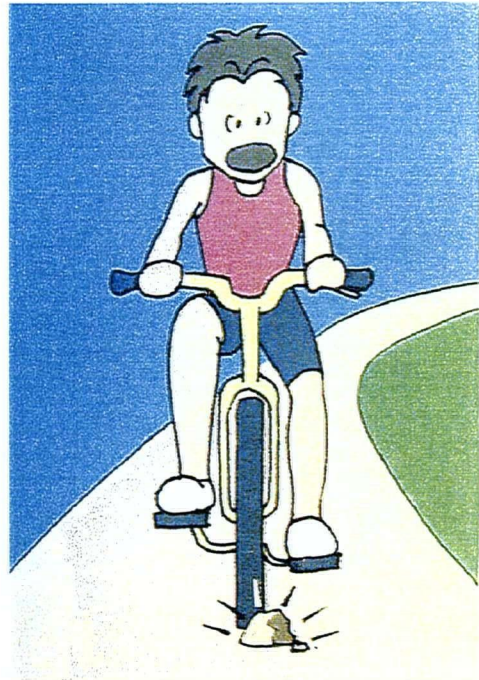


APPENDIX B: Pictures for the story RIDING A BIKE from Template IV

1



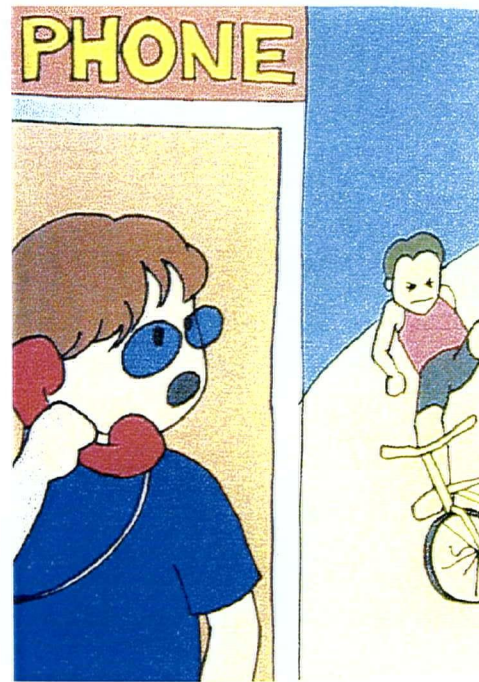
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3



4



APPENDIX C: Sample transcript marked for referential adequacy judgments

A 5-year-old (Subject # V 1) version of DANCING:

cung4 cin4 le1 zau6 jau5 jat1 go3 neoi5 zai1 hai2 dok6 tai2 gan2 syu1

once-upon-a-time. PRT.then have.one CL girl here read ASP.book

‘Once upon a time, there was a girl reading a book.’

gan1 zyu6 ling6 ngoi6 jat1 go3 neoi5 zai1 zau6 hai2 dok6 taan4 gan2 kam4 <---

afterward another one CL girl then here play ASP.piano

‘Then a different girl was playing the piano.’

gan1 zyu6 keoi5 zau6 zoek6 deoi3 bal lei4 mou5 haai4 <-----

afterward she then put-on CL ballet shoe

‘Then she put on her ballet shoes.’

gan1 zyu6 keoi5 zau6 hai2 dok6 tiu3 mou5

afterward she then here dance

‘Then she danced.’

Note: The predicate is underlined, and the referential adequacy judgment task is identified by an arrow.

APPENDIX D: Sample sentences for the imitation probe

Existential expression

jau5 jat1 zek1 si1 zi2 hai2 dok6 fan3 gaau3

have one CL lion here sleep

‘There is a lion sleeping.’

Relative NP

coeng4 gan2 gol go2 zek1 zoek3 zai2 hou2 leng3

sing ASP song that CL bird very pretty

‘The bird which is singing is very pretty.’

Determiner *ling6 ngoi6* ‘another’ NP

ling6 ngoi6 jat1 tiu4 gam1 jyu2 m sik4 je5

another one CL gold fish no eat things

‘A different gold fish is not eating.’

Demonstrative NP

ji1 zek1 tou3 zai2 sik4 gan2 hung4 lo4 baak4

this CL rabbit eat CL carrot

‘This rabbit is eating carrot.’

APPENDIX E: Frequency of forms (≥ 3) used to achieve referential adequacy in each type of function by age group

I. Maintenance of a known character

Form	Age group in years			
	3	5	7	12
Existential expression				
Proper noun				
Classifier NP				
Demonstrative NP			3	
Determiner NP				
Relative NP				
Possessive NP				
Pronoun	7	52	43	30
Zero pronoun	35	22	22	16

II. Introduction of a second new character early in the discourse

Form	Age group in years			
	3	5	7	12
Existential expression	4	38	50	34
Proper noun		8	9	
Classifier NP			7	
Demonstrative NP	5	4		
Determiner NP		19	17	8
Relative NP				
Possessive NP		6	22	24
Pronoun	3			
Zero pronoun				

APPENDIX E (Cont'd)

III. Introduction of a second new character late in the discourse

Form	Age group in years			
	3	5	7	12
Existential expression	3	28	28	13
Proper noun			5	
Classifier NP				
Demonstrative NP		5		3
Determiner NP			3	
Relative NP				
Possessive NP			8	10
Pronoun				
Zero pronoun				

IV. Reintroduction of a known character early in the discourse

Form	Age group in years			
	3	5	7	12
Existential expression				
Proper noun			7	5
Classifier NP				
Demonstrative NP		4	9	6
Determiner NP				
Relative NP		3	9	3
Possessive NP				
Pronoun		8	8	10
Zero pronoun				

APPENDIX E (Cont'd)

V. Reintroduction of a known character late in the discourse

Form	Age group in years			
	3	5	7	12
Existential expression				
Proper noun			12	13
Classifier NP			6	
Demonstrative NP		13	9	9
Determiner NP				
Relative NP		4	9	9
Possessive NP				
Pronoun		10	5	8
Zero pronoun				

APPENDIX F: Frequency of forms (≥ 3) used to achieve referential adequacy in each type of function by age and language group

I. Maintenance of a known character

Form	Group		
	SLI	Language-matched	Age-matched
Existential expression			
Proper noun	5		
Classifier NP	6		
Demonstrative NP			
Determiner NP			
Relative NP			
Possessive NP			
Pronoun	15	13	27
Zero pronoun	7	18	14

II. Introduction of a second new character early in the discourse

Form	Group		
	SLI	Language-matched	Age-matched
Existential expression	14	6	27
Proper noun			4
Classifier NP			
Demonstrative NP		5	3
Determiner NP			14
Relative NP			
Possessive NP			3
Pronoun	3		
Zero pronoun			

APPENDIX F: (Cont'd)

III. Introduction of a second new character late in the discourse

Form	Group		
	SLI	Language-matched	Age-matched
Existential expression	6	4	18
Proper noun			
Classifier NP			
Demonstrative NP			
Determiner NP			
Relative NP			
Possessive NP			
Pronoun			
Zero pronoun			

IV. Reintroduction of a known character early in the discourse

Form	Group		
	SLI	Language-matched	Age-matched
Existential expression			
Proper noun			
Classifier NP			
Demonstrative NP			3
Determiner NP			
Relative NP			
Possessive NP			
Pronoun			6
Zero pronoun			

APPENDIX F (Cont'd)

V) Reintroduction of a known character late in the discourse

Form	Group		
	SLI	Language-matched	Age-matched
Existential expression			
Proper noun			
Classifier NP			
Demonstrative NP			10
Determiner NP			
Relative NP			4
Possessive NP			
Pronoun			5
Zero pronoun			