This is to certify that the
dissertation entitled

Variable Input and the Acquisition of Plurality in Two Varieties
in Spanish

presented by

Karen Lynn Miller

has been accepted towards fulfillment
of the requirements for the

____Doctoral___ degree in _____Linguistics_____

_____
Major Professor's Signature

_____3- 1 6 - 0 7_____
Date

**PLACE IN RETURN BOX** to remove this checkout from your record.
**TO AVOID FINES** return on or before date due.
**MAY BE RECALLED** with earlier due date if requested.

| DATE DUE | DATE DUE | DATE DUE |
|----------|----------|----------|
|          |          |          |
|          |          |          |
|          |          |          |
|          |          |          |
|          |          |          |
|          |          |          |
|          |          |          |
|          |          |          |
|          |          |          |
|          |          |          |

VARIABLE INPUT AND THE ACQUISITION OF PLURALITY IN TWO
VARIETIES OF SPANISH

By

Karen Lynn Miller

A DISSERTATION

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

DOCTOR OF PHILOSOPHY

Department of Linguistics and Germanic, Slavic, Asian and African Languages

2007

# ABSTRACT

# VARIABLE INPUT AND THE ACQUISITION OF PLURALITY IN TWO VARIETIES OF SPANISH

By

Karen Lynn Miller

This dissertation presents a series of production and comprehension experiments designed to test how variable and ambiguous input affects the acquisition of grammatical morphology in children. Acquisition of plural morphology was examined in two varieties of Spanish, one where the plural morpheme is sometimes omitted in adult speech and the other where the plural morpheme is consistently produced by adult speakers. The results show that clear differences exist in the way that children acquire grammatical morphology that is consistently produced in the input vs. grammatical morphology that is variable and ambiguous in the input. That is, in production children exposed to consistent input, produce the plural morpheme consistently in their own speech, while children exposed to variable input are variable in their own production. In comprehension, the results show that children exposed to consistent input associate the plural morpheme to an interpretation of 'more than one' by at least 4 years of age, while children exposed to variable and ambiguous input are delayed in their comprehension of plural morphology. Specifically, these children do not assign an interpretation of 'more than one' to the plural morpheme until approximately 7 years of age. The results of this dissertation strongly suggest that variable and ambiguous input delays the acquisition of grammatical morphology that is affected by that variability.

# ACKNOWLEDGMENTS

The topic of this doctoral dissertation came about purely by accident. In December of 2003 I was carrying out a pilot study in Chile that examined Spanish-speaking children's ability to assign a wide-scope interpretation to plural indefinites. To my great surprise, several Chilean children were consistently treating the plural indefinite as singular, associating it to an interpretation of 'one'. After long discussion with my advisor, Cristina Schmitt, we hypothesized that this pattern might be due to the process of syllable-final /s/ lenition in Chilean Spanish, which affects the plural morpheme and creates an ambiguous input for Chilean children. At that moment, it occurred to me that language acquisition research must examine not only the effect of the *frequencies* in the input but also the effect of different *types* of input (consistent vs. ambiguous) on language development. Moreover, upon reading Kroch (1994) and Yang (2001), I began to understand how this topic is related more generally to language change. As a result of this first pilot study and several discussions with Cristina, subsequent research was carried out over the next two years in Chile and also in Mexico City, where no such lenition process takes place. The results of this research are presented here in this dissertation.

There are many people who I would like to thank for helping me carry out and develop the research presented in this dissertation. First and foremost, I would like to thank my advisor, Cristina Schmitt, to whom I will be eternally indebted for the enormous amount of time she spent teaching and training me during my graduate studies at MSU. The research presented in this dissertation would not have developed in the way that it has if not for Cristina's very insightful guidance and expertise and I am extremely flattered that she took interest in my research and education at MSU from the start.

Cristina is the best teacher I have ever had and has had a tremendous impact on my learning over the last several years. I would also like to thank Alan Munn, who was extremely generous with his time and expertise, both as a committee member and as my teacher at MSU. I am very grateful for his frank and honest comments on my graduate work and greatly appreciate his helpful suggestions on the experimental studies that were run. I thank Ana Teresa Pérez-Leroux, Barbara Abbot, Patricia Lunn, Yen-Hwei Lin and, Marcin Morzycki, who served as members on my doctoral committee, for their very useful comments and discussion of the experimental studies being carried out. I am also indebted to John Grinstead and Antoinette Hawayek for helping me set up the experimental studies in Mexico City. They both very generously dedicated their time and expertise and without their help, this dissertation would not have been possible.

There were many undergraduate and graduate students who spent long hours working on this project. I thank Katerina French for the many tedious hours she spent meticulously transcribing and coding the Chilean and Mexican data and for her useful and very insightful comments about the production data. I also thank Andrew Sanford and Pascale Schnitzer for their help transcribing and coding data. I thank Rodrigo Cárdenas, Cynthia Corona, Marena García, Edgardo Mansilla, Erika Mendoza, and Heriberto Sierra for their help in carrying out the experimental studies with children in Chile and Mexico. I also appreciate the comments and suggestions made to me by the members of the Michigan State University Language Acquisition Lab, and the audiences at BUCLD 30, GLOW 2006, the Hispanic Linguistic Symposium 2004, 2005, the Calvin College Foreign Language Forum, NWAV 2004, 2006, and X IASCL.

Finally, I would like to thank my family for being enthusiastic supporters of my graduate studies. I especially appreciate my mother, Julie Swain, for her encouragement, unique insight and great sense of humor, which made the process of writing and editing this dissertation (and graduate life in general) even more enjoyable.

TABLE OF CONTENTS

# LIST OF TABLES

# LIST OF FIGURES

CHAPTER 1

INTRODUCTION

1.0     Introduction

The goal of this dissertation is to present experimental research that provides a

deeper understanding of the role of input on first language acquisition. The process of

first language acquisition is often represented in terms of the following equation: Innate

Component + Input = L1. In the equation, the term 'innate component' refers to an innate

mechanism or language acquisition device (Language Acquisition Device (LAD),

Chomsky 1986) that allows humans to acquire language and not other species. Chomsky

(1986) defines two aspects to language: I-Language and E-Language. I-Language is the

mentally represented linguistic knowledge that a native speaker of a language has

(competence) and E-Language refers to the external observable behavior of the speaker

(performance). E-Language is influenced by extra-linguistic factors (e.g. style, social

status, gender) and the constraints that govern production and comprehension. In the

above equation, the term 'input' refers to the E-Language of the adult speakers in the

child's speech community while the term 'L1' refers to the child's target I-Language (or

grammar). The equation can thus be rewritten as: Innate Component + Adult E-

Language(s)[1] = Child I-Language. While I assume that the 'innate component' is

generally invariable across typically-developing human populations (all typically-

developing humans have the ability to acquire language), we know that the 'input' (i.e.

the speech of the speakers with whom the child interacts, Adult E-languages) varies

within and across speakers to the extent that no two humans will ever be exposed to

---

[1] 'Adult E-Language' may not be the correct term given that it is most likely the case that
children receive linguistic input not only from adults but also from other children.

1

identical linguistic input, which implies that there will never be two identical 'L1s' but instead extensive overlap between 'L1s' to allow for communication between individuals. For this reason, the term 'L1' in the equation refers to the unique I-Language of each individual learner. This process of language acquisition can be represented as in Figure 1, which was modified and adapted from Yang (2001).

Figure 1. The Dynamics of Language Acquisition (adapted from Yang 2001).
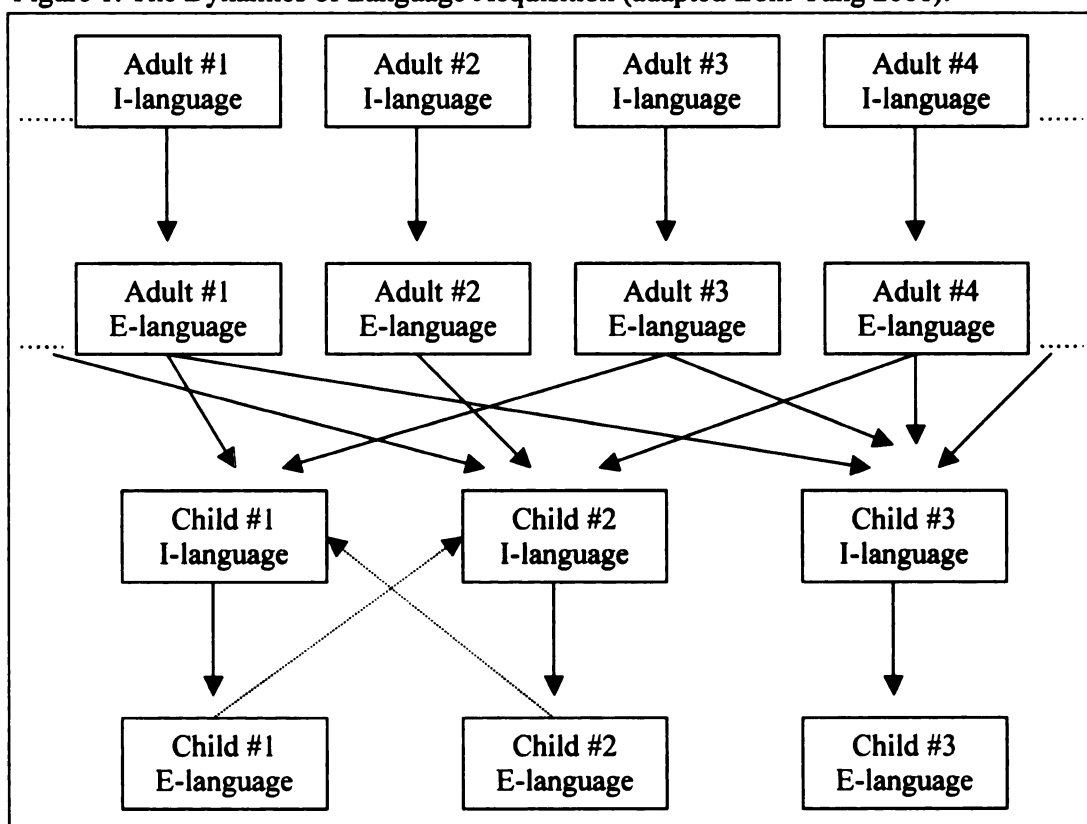


The dotted lines on either side of the Adult boxes represent the idea that the number of speakers with whom a child interacts will vary but is most likely more than 4 people (e.g. school/daycare community, neighbors, relatives, parents, church community,

pediatrician, family friends, etc.). The dotted lines extending from one Child's E-Language to another Child's I-Language represent the possibility that children rely on the input or E-Language, not only of adults, but also of other child learners when constructing their own L1s. Figure 1 represents the following ideas: (1) that children must rely on the E-Language of other speakers to construct their own I-Language (2) that the E-Language that speakers provide for children does not always match the speakers' own I-Language and (3) since the linguistic experiences of each child differ, it holds that no two I-Languages will ever be identical, neither between two children nor between any adult and child (Yang 2001).

It should be noted that Figure 1 is an oversimplification of the actual complex nature of the input in several ways including that (1) it does not include any information about whether children are selective in which speakers they rely on for input information but rather assumes that they weigh all input the same (i.e., do learners rely equally on adult vs. child input, kinship vs. non-kinship input, male vs. female input for L1 construction?), (2) the diagram is too general to represent the fact that the E-Language of speakers is variable. In other words, in Figure 1, the fact that Child #1 and Child #3 both receive input from Adult #3 does not guarantee that the input to both children from Adult #3 will be identical in terms of certain linguistic features or forms nor does it guarantee that Child #1 and Child #3 will both equally treat the input of Adult #3 as reliable for constructing their own grammar. Moreover, given linguistic variation, it is very likely that two different utterances from Adult #3 to Child #2 could differ with respect to certain grammatical features, depending on the social contexts in which the two utterances were produced. This dissertation is primarily concerned with the idea that the

input of the adult speaker (Adult E-Language) is sometimes variable with respect to certain grammatical forms, with certain morphological forms sometimes present in an utterance and other times absent in subsequent utterances, depending on a variety of extra-linguistic factors. It should also be noted that while Figure 1 shows a representation for both the I-language and the E-language of each adult and child speaker, experimental tasks on production and comprehension of plural morphology can only provide evidence about the speaker's E-language (performance). Based on the findings for the children's E-language, I will attempt to make inferences about the development of their I-language at the time of testing.

Given the very complex nature of the linguistic input, as the discussion above indicates, we start very small by examining only the acquisition of the plural morpheme associated to an interpretation of 'more than one' in two varieties of Spanish. The first variety is Chilean Spanish, where the plural morpheme is affected by a phonological process of lenition that affects all syllable-final /s/. Importantly, this lenition process is (1) not categorical but constrained by linguistic and extra-linguistic factors in the adult speech and (2) creates a fair amount of omissions. As a result, Chilean adult speakers sometimes produce the plural morpheme (as [s] or [h]) and sometimes omit it (zero form) when referring to plural sets, creating an ambiguous input with respect to plural morphology, in other words, with respect to whether plural morphology must be represented or not. The second variety is Mexican Spanish (Mexico City) where no such lenition process occurs and instead there is a categorical process of assimilation. The plural morpheme is pronounced as [s] after all vowels, voiceless consonants and pauses and as [z] after all voiced consonants. Unlike Chilean Spanish, in Mexican Spanish the

plural morpheme is systematically produced on all elements within the noun phrase in the adult speech. Plural morpheme production in Chilean and Mexican Spanish is discussed in more detail in Chapter 2 of this dissertation.

Although language acquisition research has taken *input* into consideration, very few studies have examined the effect of *variable input* on language acquisition and those that do exist have examined the acquisition of phonological variable rules by children, but the acquisition of grammatical features that are affected by variable rules in the adult speech has not received much attention. In a recent paper, however, Wilson and Henry (1998) argue that any theory of language acquisition must account for the fact that the input into the emerging linguistic system is variable, even within a monolingual context, and that a key part of the language acquisition device (LAD) is designed to enable it to cope with this variability. With this in mind, Figure 1 can be rewritten as Figure 2 to represent the ambiguous input with respect to plural morphology in Chilean Spanish.

Figure 2. Linguistic Input for Plural Morphology in Chilean Spanish.
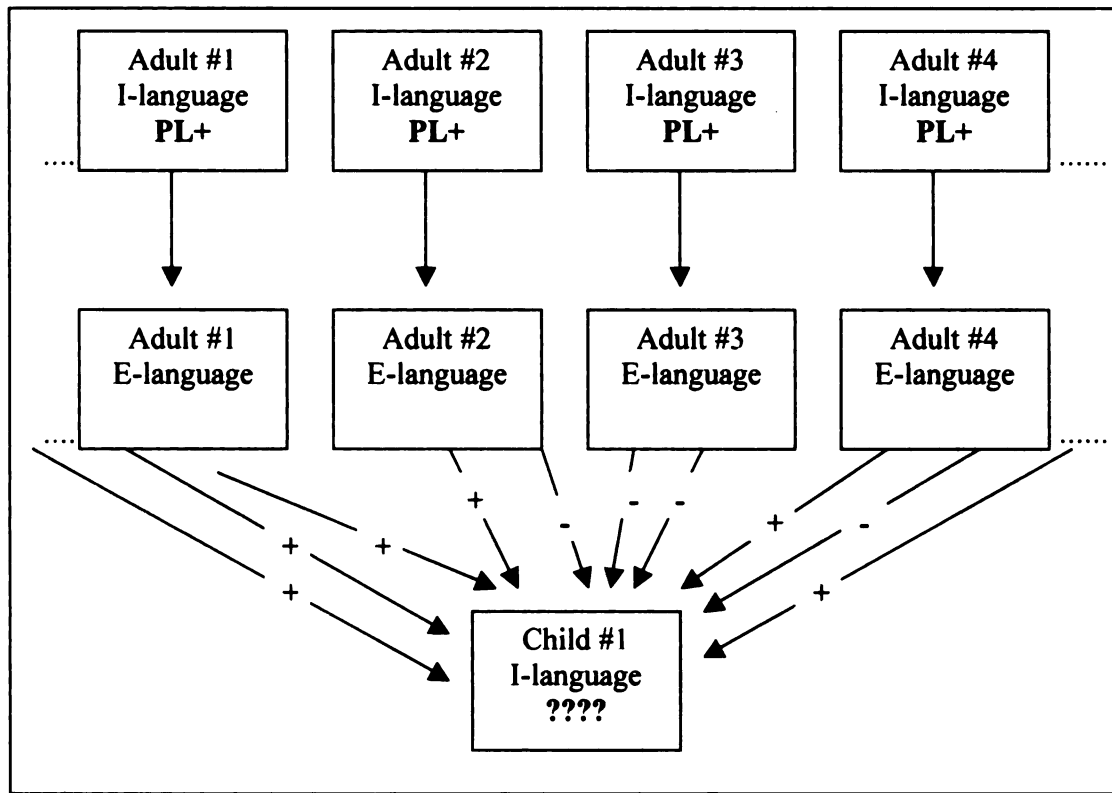


Focusing now on just one child. Figure 2 shows that while the various adult I-languages

have an underlying representation of plural (represented by PL+), the adults sometimes

produce (+) and sometimes omit (-) the plural morpheme in their own speech or E-

Language when referring to plural sets. The child only has access to the speakers' E-

Language when constructing his own I-Language. The underlying question of this

dissertation then is what type of I-Language will the Chilean child construct given the

variable and ambiguous nature of the input he is presented with, one with plural

morphology or one without plural morphology? In Figure 2, the '?' sign in the child's I-

Language box represents this underlying question. On the other hand, the input for

Mexican children (Mexico City) is consistent in the sense that adults always produce the

plural morpheme when referring to plural sets. This can be represented as in Figure 3.

Figure 3. Linguistic Input for Plural Morphology in Mexican Spanish.

| Adult #1 I-language **PL+** | Adult #2 I-language **PL+** | Adult #3 I-language **PL+** | Adult #4 I-language **PL+** |
|---|---|---|---|

| Adult #1 E-language | Adult #2 E-language | Adult #3 E-language | Adult #4 E-language |
|---|---|---|---|

+ + + + + + + +
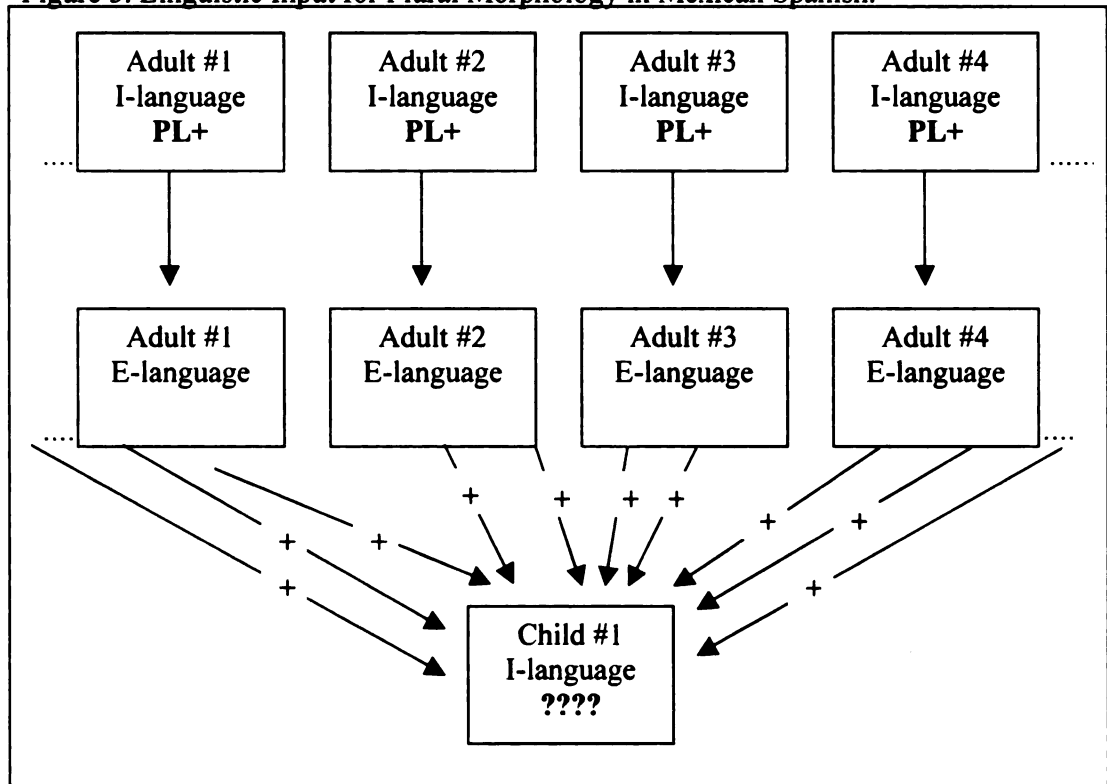
Child #1
I-language
**????**

Given the differences between the input to Mexican and Chilean children, this

dissertation asks a related question to the one posed above: Will development of plural

morphology differ between Chilean (variable input) vs. Mexican children (consistent

input), and if so, how will it differ? Comparing two varieties of Spanish, rather than two

completely different languages, provides an ideal way of examining one grammatical

form while holding other forms in the two varieties constant.

7

It may be the case that variable and ambiguous input will cause Chilean children to initially construct a grammar (I-Language) that is different from their parents' grammar and also from the grammar of Mexican children. It has been proposed in the language change literature that the linguistic input that adults provide for children (E-language) does not always reflect the adult grammar (I-language) and this may result in language change, as children construct a grammar (I-language) that is slightly different from their parents' grammar (Yang 2001). On the other hand, it may be the case that the child acquires the variable rules early on and as a result the variable input has no effect on the acquisition of the grammatical features under consideration. Instead, as long as plural morphology is overtly present in the input some of the time, the Chilean child will develop plural morphology in the same way as the Mexican child. The first part of Chapter 1 will address in more detail the underlying question of this dissertation and the second part will discuss the theoretical and applied implications of this research.

## 1.1    Statement of Problem

The underlying question of this dissertation is how does variability in the input affect child language acquisition of grammatical morphology when the variability includes omission of the morpheme and is constrained not only by linguistic (phonological, grammatical) but also extra-linguistic (socioeconomic status (SES), age, sex) factors. Specifically, as noted above, this dissertation examines the development of plural morphology in two varieties of Spanish. The first variety is Chilean Spanish, where the plural morpheme is affected by a phonological process of lenition that affects all syllable-final /s/. In Chilean Spanish the plural can surface as [s], [h] or it has a zero form. For example the word *gatos* 'cats.PL' can surface as [gatos], [gatoh], or [gato]. The

third variant [gato] is identical in form to the singular *gato* 'cat.SG' ([gato]), which creates an ambiguous input. The second variety is Mexican Spanish (Mexico City) where the plural morpheme is systematically produced as [s] or [z] in all plural noun phrases in the adult speech (e.g. [gatos]). The variant [s] surfaces before vowels, voiceless consonants and pauses while [z] surfaces before voiced consonants.

In response to the question above, it is reasonable to think that as long as the morpheme is available in the adult speech some of the time, children would acquire the morpheme and its grammatical features early on and even use it systematically, or at least more systematically than the adult. In fact, research by Singleton and Newport (2004) and Hudson Kam and Newport (2005) lend support to this idea by showing that children are able to acquire inconsistent forms in the input and, in addition, they regularize such forms in their own production. Singleton and Newport (2004) examined the development of morphology by a signing child (Simon) whose only linguistic input was that of his non-native signing parents who demonstrated inconsistency and errors in their own use of certain grammatical forms. Nonetheless, by age 7, Simon's production of these grammatical forms was much more regular and consistent than his parents and was even at the level of other signing children of the same age whose parents were native signers. However, the input that children were exposed to in the Singleton and Newport (2004) and the Hudson Kam and Newport (2005) studies is different from the input that Chilean children receive with respect to the plural morpheme in that their children were exposed to inconsistent input, that is neither linguistically nor extra-linguistically predictable. We find this type of input coming from the speech of adult non-native speakers to their children, as is the case for Simon. These studies suggest that when a particular form is

inconsistently produced in the input, in other words, the form is not linguistically

constrained and hence there are no patterns to be learned with respect to this form,

children will attempt to regularize the form by either producing it systematically or never

producing it at all in their E-language, which suggests that they have regularized the

feature in their I-language. Both systematic use and systematic non-use are forms of

regularization. However, what about the case of Chilean Spanish plural morphology

where we find that the distribution of the plural morpheme is variable, in other words, it

is linguistically and extra-linguistically constrained. Will Chilean children behave like

Simon and regularize the variable input?

It seems unlikely that children will treat variable input in the same way as

inconsistent input. Studies have shown that when the input is variable, 4-7 year old

children can acquire at least some of the variable rules, making child production of the

particular form under consideration variable as well (Kovac and Adamson 1981, Labov

1989, Roberts 1994, 1997, Smith et al. 2006). In other words, children are able to detect

patterns in the input and act upon these patterns in their acquisition of the variable form.

However, these studies also suggest that linguistic variability is learned by children

before extra-linguistic variability (i.e. variation based on SES, age, gender) (Kovac and

Adamson 1981, Roberts 1994, 1997, Smith et al. 2006). For example, Roberts (1994,

1997) found that, unlike adults, neither the addressee of the child nor the formality of the

speech task affected child use of variable forms while grammatical and phonological

constraints did. For this reason, child production patterns, although similar, were not

identical to adult production patterns. This suggests that as long as production of plural

morphology by adult Chilean speakers is linguistically constrained in the input, Chilean

children will be able to detect patterns and reproduce some of these patterns in their own speech. Therefore, we would predict that presented with variable input, children would not regularize the input, (always produce the form or never produce the form) but rather production of the form would be constrained by variable rules that the child has decoded from the adult input, at least variable rules that are linguistically constrained. For this reason, a second answer to the question posed above would be that Chilean child production of plural morphology would show *only* variable behavior. However, even if Chilean children show variability in their production of plural morphology, this would not necessarily mean that the child had linked the plural morpheme to an underlying representation for number. In other words, it does not guarantee that the child's I-language has a representation for the plural morpheme. Dominican Spanish also has syllable final /s/ lenition and recent research on Dominican Spanish-speaking children suggests that children may not have a representation for the plural morpheme, which may be due to the high level of plural morpheme omission in adult speech (Pérez-Leroux 2005). This study will be discussed in more detail in Chapter 3 of this dissertation.

It appears that matters are a bit more complicated as we have not yet taken into consideration the *comprehension* of plural morphology. It may be the case that comprehension of the plural morpheme and production of the plural morpheme occur at different stages in the child's development. If this were the case, describing the E-language and I-language of the child becomes more complicated. In order to understand how the development of the comprehension of plural morphology might unfold in children, we need first to discuss in a bit more detail the distribution of the plural variants in order to understand the learnability problem facing the child. Returning to the above

description of the variable behavior of plural morphology in Chilean Spanish we find that

there are two forms of the plural morpheme in all varieties of Spanish, [s] and [es].

Spanish words that end with a vowel have [s] as the plural morpheme and Spanish words

that end in a consonant have [es]. Given that most Spanish words end in a vowel, [s] is

the most common form. In Chilean Spanish, the [s] in both of these forms undergoes a

process of lenition and can be pronounced as [h] or can be omitted. This means that in

Chilean Spanish the plural morpheme can surface in adult speech as [s], [h], [zero form]

(omission), [es], [eh] and [e].[2] If we compare the distribution of the Chilean variants of

the plural morpheme to the distribution of the English allomorphs of the plural

morpheme, the complexity facing Chilean children becomes a bit clearer. In English the

plural allomorphs, [s], [z], [əz], are in complementary distribution and always occur in

certain phonological contexts. The allomorph [s] always occurs after voiceless

consonants (pets [pɛts], cats [kæts], paths [pæθs]), [z] after a vowel or voiced consonant

(kids [kɪdz], dogs [dɔgz], bees [biz]), and [əz], after sibilants (kisses [kɪsəz], fishes

[fɪʃəz]). However, this is not the case for Chilean plural morphology where the

distribution of the various forms ([s], [h], zero form) are not in complementary

distribution and, in addition, are determined by several interacting factors, including

phonological environment, syntactic position, and social factors, such as the formality of

the speech act or age and gender of the speaker[3]. In other words, the Chilean Spanish

word *gatos* ('cats') could surface as [gatos], [gatoh] or [gato], depending on a variety of

---

[2] Previous research on Chilean Spanish discusses only the [s] or [h] variants of the plural
morpheme; however, the data that I collected for this dissertation also shows evidence for
at least one other variant, an unreleased glottal stop.
[3] The constraints governing syllable final /s/ lenition in Chilean Spanish will be discussed
in more detail in Chapter 2.

interacting linguistic and extra-linguistic constraints. For example, the plural morpheme might have a zero form more often in direct object sentence final position than in subject position or it may surface more as [s] when the speaker is addressing a middle class stranger vs. a middle-class friend. The plural may be produced as [h] more often on definite determiners than on indefinite determiners, depending on the speech style of the speaker at the time of the utterance. Ultimately, both the English and Chilean learner have the same learning task of relating the various phonological surface forms of the plural morpheme found in the adult E-Language to each other and also to the same underlying syntactic position when constructing their own I-Language. It appears that the constraints governing the distribution of the plural morpheme in Chilean Spanish are more numerous and complex than those governing the distribution of the English allomorphs and, for this reason, we might predict that English children would acquire the English constraints before Chilean children acquire the Chilean constraints. Mexican plural morphology is similar to English plural morphology in that the distribution of the various plural forms ([s], [z], [es]) is categorical and not variable and there is not process of lenition that results in a zero form.

If we start by first looking at research that has dealt solely with the acquisition of plural variants that are categorical and in complementary distribution, as in English and Mexican City Spanish, we find evidence that 4-year-old children show productive use of some of the allomorphs but not all of them (Berko 1958, Perez-Perreira 1989). Specifically, of the two Spanish variants [s] and [es], Mexican 4-year-old children use [s] productively but not [es]. Instead, when presented with a novel word in a Berko (1958) style task that required the [es] variant of the plural morpheme, Mexican children were

found to either repeat the word without a plural morpheme or use the [s] variant. In the same way, English-speaking children were found to use the [s] and [z] variants productively but not [əz]. With respect to the *comprehension* of the English allomorphs, a recent study has noted a trend (although it did not reach significance) that 24 month old English-speaking children perform better in comprehension tasks on the plural allomorph [s] than on the allomorphs [z] or [əz] (Kouider et al. 2006). This suggests that acquisition of plural allomorphs that are categorical and in complementary distribution, may not occur all at once, but rather some variants may be acquired before others.

Even in languages like English and Mexican Spanish, where the plural variants are in complementary distribution and are categorical in nature, it appears that the plural forms are not all acquired at once. Hence, we might predict that plural forms that are variable, not in complementary distribution and also that include a zero form for the plural morpheme, as in Chilean Spanish, will likewise not be acquired all at once. In addition, if it is true that the constraints that govern variable rules are acquired *throughout* development, rather than all at once, with some linguistic constraints being learned before others, and social constraints perhaps being acquired last, as research by Kovac and Adamson (1981), Labov (1989), Roberts (1994, 1997), Smith et al. (2006) have indicated, then we would expect that within a certain age frame Chilean child behavior with respect to the acquisition of plural morphology may vary between children based on their linguistic and extra-linguistic experiences (i.e. the amount of variable input and zero forms of the plural morpheme they are exposed to). While *production* of the plural forms by children may appear variable, certain grammatical or sociolinguistic factors may not affect the variability in children as they do in adults. Furthermore, if

Chilean children have not acquired all of the linguistic and extra-linguistic constraints governing the variability of the plural morpheme in the adult speech, then they may not know that the various forms of the plural morpheme are related to the same underlying grammatical feature, in other words, that they are related to the plural. For this reason, it seems reasonable to predict that *while Chilean children may appear variable in their production of plural morphology (although variability may not pattern 100% with adults), they may be systematic in their comprehension of plural morphology, always treating the plural morpheme (either [s] or [h]) as plural or always treating it as singular, depending on their linguistic experiences at the time of testing.*

The above prediction suggests that production of plural morphology could precede comprehension of plural morphology in Chilean children. Given that we predict that Chilean children will reproduce adult patterns in their production, yet may not associate the various forms of the plural morpheme with an underlying representation of plural from the very beginning, it is possible that Chilean children will produce the plural variants in their own speech (as either or both [s] and [h]) but not associate them to an underlying representation for plural and, hence, an interpretation of 'more than one' in comprehension tasks. Intuitively, we might think that as long as the child produces certain morphological forms, they have already associated these forms to an interpretation of 'more than one'. However, research has found that in English, where the plural morpheme has no zero form and the variants are in complementary distribution, children appear to produce plural morphology before associating it to the meaning of 'more than one' in comprehension tasks. English-speaking children start producing the plural morpheme at about 1;10 years of age (Ferenz and Prasada 2002), yet Kouider et al.

15

(2006) found that English-speaking children do not associate the plural morpheme to an interpretation of 'more than one' until about 3 years of age. In addition, Diaz Campos (2005) has found that children acquire variable phonological forms on a word-by-word basis, which suggests that variable forms will be present in child speech very early in language acquisition. This does not mean, however, that children will associate the variable forms with each other or with any underlying representation from the very beginning.

Given the underlying question of this dissertation the following predictions are made for 4-7 year old Mexican and Chilean Spanish-speaking children: (1) *production* of the plural morpheme will be variable in Chilean Spanish child language but not in Mexican Spanish child language, (2) the variability found in Chilean child production will be similar to adult production but not identical, (3) in *comprehension* Chilean children will be consistent in their comprehension of plural morphology, either always associating or never associating the plural morpheme to an interpretation of 'more than one'; Mexican children will always associate the plural morpheme to an interpretation of 'more than one' (4) comprehension of plural morphology will vary between Chilean children based on their linguistic and extra-linguistic experiences, and (5) production of the plural morpheme will precede comprehension of plural morphology in both Mexican and Chilean Spanish.

In this dissertation I propose the *Variability Delay Hypothesis*, shown in (1), which hypothesizes that, all other things being equal, a grammatical morpheme, which is subject to variable rules and is ambiguous (i.e. sometimes has a zero form) in the adult speech, will be acquired later than a grammatical form that is consistently produced in the

16

adult speech. This hypothesis is adapted from Yang's (2000, 2002) Variation Model of language acquisition, which proposes that the cumulative effect of the input combined with a theory of a restricted search space can explain language acquisition. According to Yang, children make hypotheses within the limits of UG that are punished or rewarded depending on their ability to account for particular properties of the input. If the input is unambiguous and frequent, acquisition happens early. If input is ambiguous, the child may take longer to set a parameter.

(1)    Variability Delay Hypothesis (based on Yang 2000, 2002): Variability in the input will delay child comprehension of grammatical morphemes when the variability causes an ambiguity in the input (involves a zero form[4]) and is constrained not only by linguistic (phonological, grammatical) but also extra-linguistic (SES, age, sex) factors.

While there has been almost no research addressing whether variable input involving zero forms affects comprehension of grammatical morphemes, the Variability Delay Hypothesis is partially supported by a recent study by Johnson (2005) who found that AAVE-speaking children lagged behind their MAE-speaking counterparts in their ability to indirectly assign quantity to subject noun phrases based on the presence or absence of the English 3rd person singular marker in sentences like "The cats_sleep" vs. "The cat_sleeps", where the nominal plural morpheme is disguised by the initial [s] on

---

[4] Syllable-final /s/ lenition is generally discussed in the literature in terms of omission or production of the plural morpheme. However, I have been describing omission of the plural morpheme in terms of a "zero form" under the reasoning that if children have not yet acquired plural morphology, they would not associate the absence of the plural morpheme with an omission.

the verb. Johnson (2005) suggested that difficulty for AAVE children may have been due to the fact that AAVE adult speakers tend to omit the 3rd person singular marker in their own speech. In other words, the AAVE children receive an input where the 3rd person singular marker is ambiguous, it is sometimes present and sometimes absent in the input, while the MAE children receive consistent evidence for the 3rd person singular marker.

## 1.2    Theoretical Importance

While we might assume that the LAD is designed to cope with variability in the input, we do not have a clear understanding of *how* it deals with variable input (i.e. does it regularize variable input or not?) nor how different *levels* or *types* of variability affect language acquisition. Are certain constraints governing variability more difficult to acquire than others? Is variability affecting grammatical features more difficult to acquire than other forms of variability? Will variability cause any delay in the development of grammatical features? While research has suggested that frequency of forms is important in language acquisition, it may be that frequency is not so important if the form is unreliable (i.e. ambiguous) or is variable in the input. In other words, it seems reasonable that a child would learn a less frequent but more reliable form before learning a more frequent but less reliable form. For example, it may be that, while the plural morpheme is more frequent in Chilean Spanish than in English, because it is marked on nouns, determiners, and adjectives in Spanish, it may be acquired earlier in English, because it is not variable nor omitted in English, rather it is systematically produced on all plural nouns. The research presented in this dissertation will provide a clearer understanding of how both the *properties of the input* and *the frequency of those properties* affect language development.

Finally, while there are several studies on the production and comprehension of plural morphology in English, there are very few studies that have examined the production of plural morphology in Spanish-speaking children and, as far as we know, there are no studies that have examined comprehension of nominal plural morphology in Spanish-speaking children. In English the plural morpheme is only produced on the noun, while in Spanish the plural morpheme occurs on all elements within the noun phrase. Examining plural morphology production and comprehension in Mexican Spanish-speaking children will provide much needed data on the development of plural morphology in a language where the plural morpheme is consistently produced on all elements within the noun phrase. Examining comprehension and production of plural morphology in Chilean Spanish-speaking children will reveal how variable input affects the acquisition of nominal plural morphology.

## 1.3    Applied Importance

The results of the research presented in this dissertation will have important social impact on matters concerning education and language testing in children from socially disadvantaged groups since many tests of early children's language abilities do not adequately take social variation nor its effects on learning into consideration. If differences in the input affect child comprehension and production of plural morphology, it will also affect their performance on standardized tests evaluating plural usage. While several varieties of Spanish have syllable final /s/ lenition, many standardized tests measuring language competence in Spanish-speaking children fail to take into consideration this variation and instead children are tested on both their production and comprehension of the plural morpheme. In Chile some of these tests include: *el Test de*

*Desarrollo Psicomotor: 2-5 Años* (Psychomotor Development Test for 2-5 year olds) (Haeussler and Marchant 1988), *el Test para la comprensión auditiva del lenguaje de E. Carrow: Aplicación en Chile* (Auditory Language Comprehension Test of E. Carrow: Application in Chile (Pavez 2004) and *el Test Exploratorio de Grámatica Española de A. Toronto: Aplicación en Chile* (Exploratory Spanish Grammar Test of A. Toronto: Application in Chile) (Pavez 2003). Since 1997 Chile has opened a variety of *Escuelas Especiales de Lenguaje* (EEL) (Special Language Schools) in order to provide special services and specialized education to children with Specific Language Impairment (SLI). These schools are funded by the Chilean government and are invaluable to the children and families that they serve. Children must be diagnosed as SLI before they can be admitted to these schools. Unfortunately, some of the standardized tests designated by the Chilean Ministry of Education (*Decreto #1300 del Ministerio de Educación*) for diagnosing children with Specific Language Impairment (SLI) include test items that examine child comprehension and production of plural morphology. Obviously, if children are acquiring a variety of Spanish where the plural morpheme is variable and sometimes has a zero form in the adult speech, we might expect similar patterns in child production. Moreover, if variability turns out to affect child comprehension of plural morphology, then testing Chilean children on their comprehension of plural morphology is inappropriate and could unintentionally discriminate against certain groups of children. With respect to this, it is important to note that Cepeda (1995) found working-class Chilean adult speakers omitting syllable final /s/ more often than middle-class speakers, which suggests that, if plural morpheme omission affects child production and

comprehension of plural morphology, then Chilean working-class children may be the most likely to suffer the consequences of inappropriate testing methods.

Within the United States, research on Specific Language Impairment (SLI) in U.S. Spanish-speaking children found that they omitted the plural morpheme in elicitation tasks and the study suggested that omission of the plural morpheme may be a useful diagnostic for uncovering SLI in Spanish-speaking children (Bedore and Leonard 2001). Unfortunately, this research only examined Mexican Spanish-speaking children and failed to take into account the fact that in the majority of Spanish dialects (e.g. Chile, Cuba, Dominican Republic) the plural morpheme is often omitted in the speech of adult speakers. As a result, this creates the potential for misdiagnosing typically developing Spanish-speaking children as language disordered. In this sense the work relates directly to that of Seymour et al. (2004) and de Villiers et al. (2004) on standardized tests for AAVE-speaking children.

## 1.4    Organization of the Chapters

This dissertation is organized as follows: Chapter 2 provides an account of the syntax and semantics of Spanish plural morphology and an outline of syllable-final /s/ lenition in Chilean Spanish. Chapter 3 discusses previous research on the acquisition of plural morphology in Spanish and English both in areas of comprehension and production. In addition, I discuss recent research on the acquisition of inconsistent input and variable input and discuss the findings of these studies in light of the research presented in this dissertation. Chapter 4 presents the production experiments that were carried out with Chilean and Mexican children and adults. In this chapter I present results from a Free Speech Task, Naming Task and Repetition Task and discuss whether and to

what degree child production matches adult production in Mexican and Chilean Spanish and also the degree to which Chilean production matches Mexican production. Chapter 5 presents the comprehension experiments that were carried out with Chilean and Mexican children and adults. I compare Mexican vs. Chilean child comprehension and production of the plural morpheme in indefinite and definite noun phrases and also present findings on Chilean child comprehension and production of bare plural and bare singular noun phrases. Chapter 6 concludes with a summary of the results of the experiments presented in Chapters 4 and 5 and a discussion of the implications of such findings for the study of the effect of variable input on first language acquisition.

CHAPTER 2

A LINGUISTIC DESCRIPTION OF PLURAL MORPHOLOGY

2.0    Introduction

The experimental studies presented in this dissertation look at children's ability to associate the plural morpheme to an interpretation of 'more than one'. The ability to associate the plural morpheme to other properties, such as distributivity, was not tested. For this reason, the discussion in this chapter of the syntactic and semantic properties of the plural morpheme will focus on how they are related to the interpretation of 'more than one'.

Any study of the acquisition of morphology must be concerned not only with which morpho-phonological forms are associated to a particular morpheme but also with the syntactic and semantic properties of the morpheme. In other words, we need to establish what plural ([+PL] is semantically and how the presence or absence of this feature in the syntax is interpreted. Furthermore, in languages like Spanish, where singular and plural morphology show up in determiners, nouns and adjectives, we need to address whether one of these elements is the realization of an interpretable feature or whether all the realizations of plural vs. singular morphology are the result of agreement. In this chapter, I will ignore most of the debates on both the semantics of plurals in general and the syntax of agreement. I will concentrate instead on providing a general picture of number inflectional morphology.

I will make the following main claims: (1) While singular has no overt morpho-phonology, Spanish plural morphology can be realized morpho-phonologically in different ways in different dialects because /s/ undergoes two main types of processes

across dialects: a process of assimilation and a process of lenition. The process of lenition will cause a certain amount of ambiguity for listeners. (2) Semantically, I will follow Ojeda (1998) in saying that plurality in Spanish is represented as [+PL] and that plural nouns only include in their denotation plural sets but not singleton sets. (3) Syntactically, I will claim that Spanish nominal plural morphology is always a manifestation of agreement with an interpretable head. No overt manifestation of plural morphology is the spell-out of a semantically interpretable feature. Instead, all plural morphology is a manifestation of agreement with a syntactic functional head for number that takes a DP as its sister. (4) I will assume that bare singular count nouns are neither singular nor plural because they lack this functional projection for number.

This chapter is organized as follows: Section 2.1 will discuss Spanish number marking in general, outlining the syntactic categories that are marked with plural morphology. Section 2.2 will present the phonological forms of the Spanish plural morpheme in Mexican Spanish vs. Chilean Spanish and will also provide a background on some recent research on syllable-final /s/ lenition in other varieties of Spanish. Section 2.3 will present the syntactic analysis of Spanish plural morphology that is being adopted in this dissertation. Section 2.4 will provide the semantic analysis of Spanish plurality that I will be assuming. Finally, Section 2.5 will discuss the implications of the semantic and syntactic analyses for the interpretation assigned to the plural morpheme by Spanish speakers.

## 2.1    Spanish Plural Morphology

The Spanish plural morpheme occurs on all elements within the determiner phrase: the determiner, the noun and all adjectives. Examples are shown in (1) and (2) below.

(1)    a.    Las        vacas        perdidas  nunca regresaron a casa.

The.F.PL   cows.F.PL   lost.F.PL   never  came.3.PL    home

'The lost cows never came home.'


b.    La        vaca        perdida   nunca regresó a  casa.

The.F.SG  cow.F.SG  lost.F.SG  never  came.3.SG home

'The lost cow never returned home.'


(2)    a.    Los        toros        perdidos nunca regresaron a casa.

The.M.PL  bulls.M.PL  lost.M.PL  never came.3.PL    home

'The lost bulls never came home.'


b.    El        toro        perdido   nunca regresó a  casa.

The.M.SG  bull.M.SG  lost.M.SG   never came.3.SG home

'The lost bull never came home.'


The examples in (1) and (2) show that the determiner, noun and adjective all agree in number and gender. (1a) and (2a) illustrate that all of the elements within the determiner

phrase 'the lost cows' are marked with a plural morpheme unlike English, which mainly exhibits plural morphology only on the noun. The Spanish plural morpheme is phonetically realized in different ways depending on the variety of Spanish under investigation (see Section 2.2).

While the Spanish plural morpheme occurs on all elements within the determiner phrase, it is not always the sole indicator of number in the linguistic input to children. There are two other potential indicators of plurality: verbal morphology and the form of the determiner itself.

As is well-known, Spanish subjects agree with verbs in number, as shown in (1) and (2), where the singular (*regresó* 'returned.3.SG') and plural (regresaron 'returned.3.PL') forms of the verb *regresar* ('return.NONFIN') agree with singular and plural subjects, respectively. However, Spanish also allows, and in many cases prefers, the use of null subjects. In such cases where the subject is null, only the verb supplies number information about the nominal subject. This fact is important as it suggests that verbal morphology may provide reliable information about nominal number (nouns in subject position but not object position) for children. Examples of constructions involving null subjects are shown in (3) and (4).


(3)     Regresaron a  casa.

        Came.3.PL    home

        'They came home.'

(4)     Regresó a casa.

        Came.3.SG home

        'It came home.'


The example in (3) involves a verb in the 3<sup>rd</sup> person plural and the subject is interpreted as plural. The example in (4) contains a verb in the 3<sup>rd</sup> person singular and the subject is interpreted as singular.

While syllable-final /s/ lenition may affect nominal number marking and create potential ambiguity in the input, syllable final /s/ lenition almost never affects verbal number marking, because verbal morphology is generally not represented phonologically as /s/, and, when it does affect verbal morphology, it generally does not create any number ambiguities in the input, as illustrated in (5) and (6).

|  |  |  |  |  | Possible Pronunciations |
| --- | --- | --- | --- | --- | --- |
| (5) | La | niña | está | saltando. | [la] [niña] [esta] |
|  | The.F.SG | girl.F.SG | is.3.SG | jumping |  |
|  | 'The girl is jumping.' |  |  |  |  |
|  |  |  |  |  |  |
| (6) | Las | niñas | están | saltando. | [las], [lah], [la] |
|  | The.F.PL | girl.F.PL | are.3.PL | jumping | [niñas], [niñah], [niña] |
|  | 'The girls are jumping.' |  |  |  | [estan] |

The examples in (5) and (6) illustrate that the singular and plural forms of the subject determiner and subject noun may overlap in varieties of Spanish that have syllable-final /s/ lenition (i.e. [la] and [niña] can both be used in semantically plural and singular noun phrases). On the other hand, the singular and plural forms of the verb do not overlap because the 3rd person plural verbal morpheme occurs as /n/, not /s/. This suggests that verbal morphology may be a more reliable indicator of number than nominal morphology in varieties of Spanish with syllable final /s/ lenition. While nominal plural morphology is sometimes present and sometimes absent on semantically plural nouns or determiners, verbal plural morphology will always be present when the nominal subject is plural, which might affect what children exposed to such a dialect initially rely on when assigning number to subject noun phrases. Table 1 provides an overview of Spanish present tense verbal morphology.

Table 1. Verbal Morphology: Chilean Spanish Present Tense.

| Person/Number | estar ('to be') | Verbal Morpheme |
|---|---|---|
| 1st singular | estoy [estoi] | -oy [oi] |
| 1st plural | estamos [estamos], [estamoh], [estamo] | -mos [mos], [moh], [mo] |
| 2nd singular | estás [estas], [estah], [esta] | -s [s], [h], zero |
| 2nd plural | están [estan] | -n [n] |
| 3rd singular | está [esta] | -zero |
| 3rd plural | están [estan] | -n [n] |

Table 1 shows the various verbal morphemes and possible pronunciations in Chilean Spanish. The data illustrate that, for the most part, syllable final /s/ lenition does not create number ambiguity in verbal morphology. The only possible ambiguity would be associated to person and would occur between 2<sup>nd</sup> person singular vs. 3<sup>rd</sup> person singular where there is overlapping of forms. For this reason, it appears that in Chilean Spanish verbal number morphology is more reliable than nominal number morphology.

The second indicator of number is the form of the determiner. While Spanish plural determiners carry a plural morpheme, the form of certain determiners guarantees a 'more than one' interpretation regardless of whether the listener takes into consideration the plural morpheme or not. This, of course, is the case for quantifiers such as *todos* 'all.PL/every.PL', for example, and some determiners even have different forms in the singular vs. plural in addition to the difference associated with the presence or absence of the plural morpheme. For example, singular masculine determiners are often different in form from plural masculine determiners. This is illustrated in Table 2.

Table 2. Spanish Determiners.

|  | **Singular** | **Plural** | **Gender** |
|---|---|---|---|
| **Definite** | el | los | Masculine |
|  | la | las | Feminine |
| **Indefinite** | un | unos | Masculine |
|  | una | unas | Feminine |
| **Indefinite** | algún | algunos | Masculine |
|  | alguna | algunas | Feminine |

Note in Table 2 that the only difference between the plural and singular feminine determiners is the presence vs. the absence of the plural morpheme. However, the forms of the masculine determiners are different when plural vs. singular.

While plural masculine determiners are generally different in form from singular masculine determiners, there are cases where plural and singular masculine determiners only differ by the presence or absence of the plural morpheme. One such case is in constructions involving noun drop, which is illustrated in (7).

(7)    a.    <u>Un        monito     pequeño</u>  está    encima de la  mesa.

                 A/one.M.SG monkey.M.SG small.M.SG is.3.SG on top of the table

                 'A/one small monkey is on the table.'

b.  <u>Uno          grande</u>  está  encima de la  cama.

A/one.M.SG big.M.SG is.3.SG on top  of the bed

'A big one is on top of the bed.'


c.  <u>Unos        grandes</u> están  encima de la  casa.

Some.M.PL big.M.PL are.3.PL on top  of the house

'Some big ones are on top of the house.'


The examples in (7) demonstrate that when the noun is dropped, the indefinite plural and singular masculine determiners only differ by the presence or absence of the plural morpheme. The data presented in (7) are important for the present dissertation because they demonstrate that the masculine plural vs. singular indefinite determiners, in addition to feminine plural vs. singular indefinite determiners, sometimes differ only by the presence or absence of the plural morpheme. This means that Spanish-speaking children must be able to associate the plural morpheme to an interpretation of 'more than one' in order to correctly comprehend constructions like those presented in (7) as plural. However, note the examples of definite noun phrases with noun drop presented in (8).


(8)  a.  <u>El          elefante        grande</u>  está  encima de la  mesa.

The.M.SG elephant.M.SG big.M.SG is.3.SG on top  of  the table

'The big elephant is on the table.'

b.　　El　　　pequeño　está　encima de la　cama.

The.M.SG small.M.SG is.3.SG on top of the bed

'The small one is on the bed.'


c.　　Los　　　pequeños　están　encima de la　casa.

The.M.PL small.M.PL are.3.PL on top of the house

'The small ones are on the house.'


The examples in (8) illustrate that the forms of the definite plural vs. singular determiners remain different, even when the noun is dropped. With respect to language acquisition, while the Spanish-speaking child must rely on the presence vs. absence of the plural morpheme at least some of the time to correctly assign number to masculine indefinite noun phrases, this is not the case for masculine definite noun phrases, which are different in form when plural vs. singular.[5]

---

[5] It should be noted that Spanish allows a neuter determiner *lo* 'the.SG' to occur before adjectives in constructions like (i) and (ii). Hence, one might be tempted to think that masculine plural vs. singular definite determiners at times differ only with respect to the plural morpheme. However, this is not the case, as the plural counterparts of these constructions do not exist, as (iii) illustrates.

(i)　　Lo　　importante　es que llegaste.
　　　 The.SG important.SG is that arrived
　　　 'The important thing is that you arrived.'

(ii)　　Lo　　bueno　es que llegaste.
　　　 The.SG good.SG is that arrived
　　　 'The good thing is that you arrived.'

(iii)　　*Los　importantes son que llegaste y　que no　te　　perdiste.
　　　　 The.pl important　are that arrived and that NEG REFL lost.2.SG.PAST
　　　　 'The important things are that you arrived and that you didn't get lost.'

32

In Spanish direct and indirect object pronouns are also marked for number as shown in (9)-(10).


(9)    a.    Lo/    la    compré.

It.M.SG/it.F.SG bought.1.SG.PAST

'I bought it.'


        b.    Los/    las    compré.

Them.M.PL/them.F.PL bought.1.SG.PAST

'I bought them.'


(10)    a.    Le    mandé    una carta.

Her/him.NEUT.SG sent.1.SG.PAST a    letter

'I sent her/him a letter.'


        b.    Les    mandé    una carta.

Them.NEUT.PL sent.1.SG.PAST a    letter

'I sent them a letter.'


Unlike the case for definite masculine determiners, the only difference between the plural and singular object pronouns is the presence or absence of the plural morpheme.

Spanish demonstratives are also marked with number. The form of the masculine demonstrative is different for singular vs. plural, while the only difference between the

plural vs. singular feminine demonstratives is the presence or absence of the plural

morpheme. This is shown in Table 3.

Table 3. Number Marking on Spanish Demonstratives.

| Singular | Plural | Gender |
| --- | --- | --- |
| este 'this.M.SG' | estos 'these.M.PL' | Masculine |
| esta 'this.F.SG' | estas 'these.F.PL' | Feminine |
| ese 'that.M.SG' | esos 'those.M.PL' | Masculine |
| esa 'that.F.SG' | esas 'those.F.PL' | Feminine |

Finally, Spanish allows both bare plural and bare singular count nouns in

complement position, as in (11), although the distribution of bare singular count nouns is

more restricted than for bare plural count nouns.

(11)   a.   Tengo pelota.

I have ball.F.SG

'I have a ball/some balls.'

b.   Tengo pelotas.

I have balls.F.PL

'I have balls.'

The translations for (11a) illustrate that bare singular count nouns are associated to both an interpretation of 'more than one' and 'one' while (11b) shows that bare plurals are only associated to only an interpretation of 'more than one'.

While bare singulars and bare plurals are only allowed in complement position, the distribution of bare singulars is much more restricted than for bare plurals. Bosque (1996) observes that Spanish bare singulars, in the dialects where they are found, are allowed as verbal complements in certain contexts: as objects of intensional predicates, as in (12), as objects under negation, as in (13), and in constructions that denote inherent properties of a particular entity or where the object has a unique interpretation, as in (14).

(12)    a.      Ando          buscando casa

                Go.1.SG.PRES looking    house

                'I am looking for a house.'

        b.      Quiero          auto.

                Want.1.SG.PRES car

                'I want a car.'

        c.      Necesito       lápiz.

                Need.1.SG.PRES pencil

                'I need a pencil'

(13)  No   tengo       lápiz.

NEG  have.1.SG.PRES pencil

'I don't have a pencil.'


(14)  Llevaba        chaqueta.

Wore.1.SG.PAST jacket

'He was wearing a jacket.'


In our own fieldwork, we found that Chilean Spanish also allows non-intensional verbs to take bare singular objects, as in (15).


(15)  a.    Me   compré          auto.

REFL bought.1.SG.PAST car

'I bought myself a car.'


b.    Me   conseguí     perro.

REFL got.1.SG.PAST dog

'I got myself a dog.'


c.    Hicimos        muralla.

Made.1.PL.PAST wall

'We put up a wall (fire wall).'

d.    Me   falta              cuchillo.

REFL miss.3.SG.PRES knife

'I'm missing a knife.'

One noticeable characteristic linking together several of these predicates is possession. The above predicates allowing bare singular objects all seem to denote some type of possession, lack of possession or intention of possession (Miller and Schmitt 2004).

In summary, Spanish plural marking has the following characteristics: (1) plural marking occurs on all elements within the determiner phrase, (2) Spanish has subject-verb agreement and hence the verb also provides number information about nominal subjects (3) plural masculine determiners generally differ in form from singular masculine determiners, (4) plural feminine determiners only differ from singular feminine determiners by the presence or absence of the plural morpheme, (5) Plural and singular object pronouns only differ with respect to the presence or absence of the plural morpheme, and (6) bare plural count nouns, which are associated to an interpretation of 'more than one', and bare singular count nouns, which are associated to both an interpretation of 'one' and 'more than one', only differ by the presence or absence of the plural morpheme.

2.2    The Phonological Form of the Spanish Plural

The Spanish plural morpheme is realized as -/s/ and -/es/. –/s/ occurs post-vocalically and -/es/ occurs after consonants due to an epenthetic [e] which breaks up post-vocalic consonantal clusters. Since most words in Spanish end in a vowel, -/s/ is the most frequent form of the plural morpheme. Examples are provided in Table 4.

Table 4. The Spanish Plural Morpheme.

|  | -/s/ | -/es/ |
|---|---|---|
| **Singular** | casa, auto, elefante, menú, kiwi | lápiz, flor, pan, pared, reloj, árbol |
| **Plural** | casas, autos, elefantes, menús, kiwis | lápices, flores, panes, paredes, relojes, árboles |

There are at least two types of phonological processes that affect the realization of syllable final /s/ in Spanish: (i) a process of voicing assimilation and (ii) a process of lenition. The former process occurs in Mexican Spanish (Mexico City) and the latter in Chilean Spanish. In the following sections, the phonological form of the Spanish plural morpheme is first presented for Mexican Spanish (Mexico City) and then for Chilean Spanish (Punta Arenas).

2.2.1  Mexico City Spanish

In the Mexico City variety we find the first type of process. In such varieties, the plural -/s/ is voiced, occurring as [z], when it precedes a voiced consonant and voiceless, occurring as [s], when it precedes a voiceless consonant, a vowel or a pause (Barrutia and Schwegler 1994). Importantly, [z] occurs only as an allophone of /s/ in Spanish. It is not an independent phoneme, as in English. This process of assimilation is illustrated in (16).

(16) a. las bolitas       [laz βolitas#]

          the.F.PL marbles.F.PL

    b. las manos       [laz manos#]

          the.F.PL hands.F.PL

    c. las hojas       [las oxas#]

          the.F.PL sheets.F.PL

    d. las papas       [las papas#]

          the.F.PL potatoes.F.PL

In Mexican Spanish (Mexico City) number is systematically marked by adult speakers. Morgan (1998) cites Lipski (1994) as reporting that "throughout the interior regions of Mexico, syllable-final /s/ rarely deletes or even aspirates." and Canfield (1982) as noting that "[a]mong other speakers of Spanish, a Mexican is recognized by his tendency to lengthen the articulation of /s/..." (p. 82).

## 2.2.2 Chilean Spanish

The phonological form of the plural morpheme in Chilean Spanish is quite different from that in Mexican Spanish. Chilean Spanish undergoes a process of lenition where all syllable final /s/ surfaces as either [s], [h], or is omitted. Because the plural morpheme occurs as /s/ in syllable final position, this process of lenition affects the pronunciation of the plural morpheme as well. While lenition is generally discussed in

39

terms of aspiration or omission in Chilean Spanish, our data indicate that /s/ can also

surface as a glottal stop or a lengthened vowel. For the purpose of this dissertation,

however, we will only examine the acquisition of aspiration [h] and the alveolar fricative

[s] forms, given that (1) previous research has mainly focused on these two variants, (2)

[h] appears to be the most common variant in Chilean Spanish and (3) [s] is the most

common form in Mexican Spanish. The Chilean pronunciation of syllable final /s/ is

illustrated in (17) for morphological /s/ and (18) for non-morphological /s/.


Possible Pronunciations


(17)   a.    las      bolitas      [las], [lah], [la]/ [βolitas], [βolitah], [βolita]

            the.F.PL marbles.F.PL



       b.    las      manos        [las], [lah], [la]/ [manos], [manoh], [mano]

            the.F.PL hands.F.PL



       c.    las      hojas        [las], [lah], [la]/ [oxas], [oxah], [oxa]

            the.F.PL sheets.F.PL



       d.    las      papas        [las], [lah], [la]/ [papas], [papah], [papa]

            the.F.PL potatoes.F.PL

(18)  a.  bus                 [bus], [buh], [bu]

         bus.SG


      b.  lápiz               [lapis], [lapih], [lapi]

         pencil.SG


      c.  lapices             [lapises], [lapiseh], [lapise]

         pencils.PL


The phonological variant ([s], [h], or zero) that surfaces is dependent on both linguistic

and extra-linguistic factors. Cepeda (1995) collected 16,117 occurrences of syllable-final

[s] lenition in Chilean Spanish by interviewing 34 Chilean adult speakers from Valdivia,

Chile in their homes for 30 minutes each. Valdivia, Chile is located in the southern part

of Chile, approximately 900 miles north of Punta Arenas, where the Chilean subjects in

this dissertation were tested, and 500 miles south of Santiago, the capital of Chile.

Cepeda found that the highest rate of syllable final /s/ omission occurred with the plural

morpheme /-s/ on nouns and adjectives (but not on determiners), rather than with non-

morphological /s/. Table 5 shows the percentage of plural morpheme production ([s] or

[h]) vs. omission in Chilean Speakers.

Table 5. Plural Morpheme Lenition by Syntactic Category in Chilean Spanish.

| | [s] or [h] | Omission | Total Number |
|---|---|---|---|
| **Premodifiers** | 79% | 21% | 3028 |
| **Nouns** | 47% | 54% | 4580 |

*Adapted from Cepeda (1995).

In her analysis, Cepeda grouped all determiners as "noun premodifiers", which in addition to determiners included prenominal adjectives and numerals. For this reason, it is difficult to know for sure what percentage of determiners occurred with or without the plural morpheme. In any case, Table 5 suggests that the plural morpheme is omitted much more often on nouns than on determiners. In fact, Table 5 reveals that the plural morpheme was omitted by adult Chilean speakers (from Valdivia, Chile) approximately half of the time on nouns (54% of the time).

Cepeda (1995) also found that length of the word in terms of number of syllables was a significant predictor of plural morpheme omission on noun premodifiers (determiners, adjectives, numerals), which is important because it provides insight on the type of determiners that favored or disfavored plural morpheme omission. Table 6 shows the percentage of plural morpheme omission in monosyllabic vs. polysyllabic noun premodifiers.

Table 6. Plural Morpheme Lenition in Mono- and Polysyllabic Noun Premodifiers.

| | Morphological | | Non-morphological | |
|---|---|---|---|---|
| | Monosyllabic | Polysyllabic | Monosyllabic | Polysyllabic |
| [s] | 6% | 6% | 15% | 14% |
| [h] | 81% | 60% | 63% | 37% |
| Omission | 13% | 34% | 22% | 49% |
| Total Number | 1750 | 854 | 315 | 109 |

*Adapted from Cepeda (1995).

Table 6 reveals that omission of the plural morpheme in monosyllabic noun premodifiers occurred only 13% of the time while omission of the plural morpheme in polysyllabic noun premodifiers occurred 34% of the time. While Cepeda does not present her data in terms of definite vs. indefinite determiners, Table 6 suggests that the plural morpheme is omitted more often on indefinite determiners, which are polysyllabic in Spanish, (e.g. unos, 'some' algunos 'some') than on definite determiners, which are monosyllabic in Spanish, (e.g. las, 'the.F.PL', mis 'my.PL'). Table 6 also shows there is a strong preference for Chilean adults to use the plural variant [h] on determiners.

Phonological environment also influences syllable final /s/ lenition in Chilean Spanish. Cepeda found that the following sound affected whether syllable final /s/ was produced as [s], [h] or zero. This is illustrated in Table 7.

Table 7. The Effect of Phonological Environment on /s/ Lenition in Chilean Spanish.

| | __#C [-cont] | __#C [+cont] | __#C [+nas] | __#V (Unstressed) | __#V (Stressed) | __## (Pause) |
|---|---|---|---|---|---|---|
| [s] | 1% | 1% | 1% | 6% | 25% | 12% |
| [h] | 83% | 55% | 71% | 42% | 38% | 35% |
| Omission | 16% | 44% | 28% | 52% | 36% | 54% |
| Total | 3594 | 3552 | 1406 | 2716 | 1018 | 3831 |

*Adapted from Cepeda (1995).

Table 7 shows that [h] is more common than [s] in Chilean adult speech. In addition, syllable-final /s/ is produced more often when followed by a non-continuant consonant or a nasal consonant and omitted more often when followed by a continuant consonant, an unstressed vowel, or a pause.

Finally, Cepeda reported that the level of syllable-final /s/ omission was linked to social class, with omission being much more common in the language of working-class speakers than in middle-class and upper class speakers. A summary of the distribution of the various pronunciations of syllable-final /s/ by social class is shown in Table 8.

44

Table 8. Social Distribution of Syllable Final /s/ in Chilean Spanish.

|  | Social Class | | |
| --- | --- | --- | --- |
|  | **High** | **Mid** | **Low** |
| **Retention [s/h]** | 68% | 65% | 50% |
| **Omission** | 32% | 35% | 50% |
| **Tokens** | 5338 | 4968 | 5791 |

Table 8 shows that working-class Chilean adults omit syllable-final /s/ more often than middle-class and upper class speakers, with working-class adults omitting syllable-final /s/ on approximately half of all tokens.

In summary, Cepeda (1995) reported that morphological -/s/ is omitted more often than non-morphological /s/ and that [h] was the most frequent variant in the data she collected. Cepeda's data also suggest that there are several constraints governing plural morpheme omission: (1) the plural morpheme is omitted more often on nouns than on determiners, (2) the plural morpheme is omitted more often on polysyllabic noun premodifiers (e.g. *algunos* 'some.PL') than on monosyllabic determiners (e.g. *los* 'the.PL'), (3) the phonological environment immediately following the plural morpheme affects lenition, and (4) working-class speakers tend to omit the plural morpheme more often than middle-class and upper-class speakers. Chapter 4 of this dissertation will present additional data collected from Chilean adult speakers (from Punta Arenas, Chile) with the intention of replicating Cepeda's findings. Chapter 4 will also present data on syllable-final /s/ lenition in Chilean children.

## 2.2.3 Syllable Final /s/ Lenition in Other Varieties of Spanish

Syllable final /s/ lenition is found in several dialects of Spanish (Lipski 1985, 1986, 1999; Cepeda 1995). Terrell (1981) noted that aspiration and deletion of syllable final /s/ is found in all levels of society in the Caribbean (Cuba, Dominican Republic, Puerto Rico) and in Southern Spain (Andalucia), the Canary Islands, and also in Chile, Argentina, Uruguay and Paraguay. The only Spanish-speaking regions which do not appear to aspirate or delete syllable final /s/ are the interior highlands of Mexico (including Mexico City), Guatemala, Costa Rica, Colombia, Ecuador, Peru, Bolivia and Northern Spain. Syllable final /s/ lenition, with a tendency for omission in working-class speech, was first reported for Chilean Spanish around the 19th Century (Cepeda 1995 cites the following authors: Lenz 1940, Alonso and Lida 1940, Oroz 1966). It has been proposed that syllable final /s/ lenition originated in the Canary Islands and reached the Americas by way of slave ships that stopped at the Canary Islands before leaving for the Americas (Barrutia and Schwegler 1994).

Terrell (1981) noted that syllable-final /s/ lenition appears to be at a more advanced stage in Dominican Spanish than in other varieties of Spanish. Dominican Spanish appears to have lost syllable final /s/ altogether, and he notes that for the most part any production of /s/ in final position is often the result of hypercorrection. Morgan (1998), for example, also notes that the stigmatization of final /s/ *omission* that characterizes working-class speech in the Dominican Republic has given rise to hypercorrection in Dominican Spanish-speaking adults, where working-class speakers will often insert [s] and/or [h] in syllable final position in more formal social contexts. This phenomenon is often referred to by Dominican speakers as *'Hablar Fisno'*, which

comes from the phrase *hablar fino* ('refined speaking'), where an [s] or [h] has been

inserted in syllable-final position of the first syllable in *fino* ('refined').

Morgan (1998) collected 16 minutes of free speech from a Dominican-speaking

working-class male and found that he hypercorrected in 115 words. Of those 115 words,

70 involved [s]-insertion while 45 involved [h]-insertion. Hypercorrection occurred in all

syntactic categories, including nouns, verbs, determiners, pronouns, adverbs and

prepositions, as shown in Table 9 below.

Table 9. Hypercorrection in Dominican Spanish.

| Syntactic Category | Spanish Word | Hypercorrected Form |
|---|---|---|
| Noun | foto ('photo.SG') | [fótos] |
| Adverb | aquí ('here') | [akís] |
| Numeral | siete ('seven') | [s$^y$étes] |
| Verb | torturaba ('he tortured') | [torturábas] |
| | imitando ('imitating') | [imitándos] |
| Adjective | nuevo ('new') | [n$^w$évos] |
| Determiner | la ('the.SG') | [lah] |
| | una ('a/one.SG') | [únah] |
| Preposition | de ('of') | [deh] |
| Pronoun | se ('himself') | [ses] |

*Adapted from Morgan (1998).

Table 9 shows that as a result of hypercorrection, even words that cannot carry plural morphology, as adverbs and prepositions, have /s/ added to them. In other words, not only is the plural morpheme sometimes omitted in plural noun phrases in Dominican Spanish but it is also sometimes placed on semantically singular nouns, as shown in the example taken from Morgan (1998) in (19) where a Dominican tourist guide is referring to an important house on a tour in the Dominican Republic.


**Singular: Standard Spanish**

(19) a. <u>La      casa      construida</u> en piedra

The.SG house.SG built.SG    in stone

'The house built in stone…'


**Plural: Standard Spanish**

b. <u>Las    casas    construidas</u> en piedra

The.PL house.PL built.PL    in stone

'The houses built in stone…'


**Singular: Dominican Spanish**

c. <u>Las    casa    construida</u> en piedra

The.SG house.SG built.SG    in stone

'The house built in stone…'    (taken from Morgan 1998)

Although the Dominican speaker is referring to a single house in (15c), the definite determiner *las* (the.PL) is used. Morgan's data suggests that the plural morpheme in Dominican Spanish is no longer associated solely with the meaning of 'more than one' but rather seems to have taken on a different meaning, which is related to social factors.

The data reported in Morgan's study is relevant for this dissertation as they lend support to the idea of a gradual change in plural marking over time. The data suggests that for many Dominican speakers [s]/[h] is no longer associated to an interpretation of 'more than one' as adult speakers mark [s]/[h] even on semantically singular nouns and determiners and they also mark other syntactic categories (verbs, prepositions, adverbs) with [s]/[h]. Instead, it appears that [s]/[h] have come to hold some social meaning for adult speakers, but not necessarily number information.

## 2.3    The Underlying Syntactic Representation of the Spanish Plural

Chapter 1 introduced the theoretical proposal, put forth by Yang (2001), that the adult E-language does not always match the adult I-language and this may result in language change as children acquire a grammar that is slightly different from their parents. The present dissertation examines whether Spanish-speaking children acquire plural morphology when the input, or the adult E-Language, is variable and whether development of plural morphology differs between children exposed to and E-language with systematic input vs. variable input. In this section I will present a syntactic analysis of Spanish plural morphology with the intention of providing insight on the representation of plural morphology in the Spanish-speaking adult I-language.

I will adopt Sauerland's (2003) proposal for the syntactic representation of plurality, which argues for a separate syntactic head for number, called $\phi$P, located above

the DP. While previous research on plurality based on English has assumed that the plural feature on nouns is semantically interpretable while the plural feature on verbs is uninterpretable, Sauerland notes that in languages like German, overt plural morphology is also found on the determiner, in addition to the noun and that, for this reason, other options are needed for determining exactly which nominal plural features have semantic content. In other words, is it the plural morpheme on the noun or on the determiner that has semantic content? In this sense, Spanish is like German in that both the determiner and the noun have overt plural morphology.

In order to account for languages like German, Sauerland argues that number features with semantic content are contained in the φ-head and that the plural feature on both determiners and nouns are uninterpretable and are instead licensed by syntactic agreement with the φ-head (the plural feature on the verb is licensed through syntactic agreement with the φP). Syntactically the φ-head can combine with any DP as long as the semantics of the DP match that of the φ-head. A syntactic representation is shown in (20)[6].

(20)
```
        φP
       /  \
      φ    DP
   [+PL]  /  \
         D    NP
        las (the.PL)  vacas (cows.PL)[7]
```

---
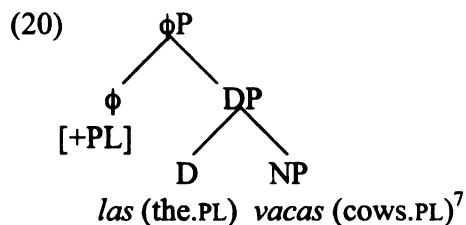
[6] This representation allows Sauerland to account for languages like German where the pural morpheme can occur both on the noun and determiner.
[7] It is assumed that indefinite determiners and numerals occur in NumP, which occurs between DP and NP.

Sauerland proposes that the number features of the φ-head are licensed solely by the semantics and that the number features on the φ-head license uninterpretable number features on the determiner and noun through syntactic agreement, as illustrated in (20)[8].

Sauerland proposes that the [SG] feature on the φ-head expresses a presupposition of a single atom or a mass, while the [PL] feature has no inherent presupposition, rather it gets a plural reading through implication. Sauerland argues that the distribution of [PL] is constrained by the pragmatics, which requires that, of two alternative morphemes, the one with the stronger presupposition must be used whenever its presupposition is satisfied. In other words, the plural morpheme is only used if the singular is blocked.

While I will assume the representation in (20) for the Spanish plural, I will depart from Sauerland with respect to his semantic representation of plurality as a contrast between [+SG] vs. [-SG] and also his analysis that the plural interpretation arises through implicature. Unlike Sauerland, I will assume that plurality is expressed in Spanish as [PL] on the φ-head and that the absence of [PL] is associated to an interpretation of 'one'. This will be discussed in more detail in Section 2.4. Like Sauerland, however, I will assume that Spanish morphological number on the determiner and noun is interpreted indirectly

---

[8] Within the Minimalist Program Chomsky (1995) discusses the notion of checking where functional categories carry interpretable and uninterpretable features. Interpretable features receive an interpretation at the level of derivation corresponding to Logical Form while uninterpretable features are checked and eliminated before Logical Form (i.e. the interface between the grammatical and the conceptual-intentional components). Hence, given the sentence "The duck swims" the subject DP "the duck" has the interpretable feature [3 person] and the verb "swims" has the uninterpretable feature [3 person]. These two features agree, are checked and the uninterpretable features are eliminated before the expression reaches the level of the derivation corresponding to Logical Form. The uninterpretable features determine what elements can converge within the structure. On the other hand, in the sentence "The ducks swim" the DP "the ducks" has the feature [plural] which is an interpertable feature, and plays a role in determining the meaning of the work 'duck'.

through syntactic agreement. Any element within DP (e.g. noun, determiner, adjective), which is marked with the plural morpheme, will be used by the speaker in his interpretation of quantity because it is the reflex of agreement with a plural φ-head.

While this proposal argues that the φP combines with DPs, I will assume that bare singular count nouns are not DPs in Spanish and, hence, are not dominated by a φP. As a result, bare singular count nouns, unlike bare plurals, have no number interpretation associated to them; they are consistent with both an interpretation of 'more than one' and 'one'. In the literature, bare singulars have been treated as names of kinds as in Carlsonian accounts (Carlson 1977, Chierchia 1998, Munn and Schmitt 2003) or as incorporated nominals (Masullo 1992). For the purposes of this dissertation, I will follow Masullo (1992) in claiming that Spanish bare singular count nouns are incorporated nominals.

Masullo (1992) bases his analysis of bare singular count nouns on Grimshaw's (1991) notion of extended projection that distinguishes between verbal projections and nominal projections. VP, IP and CP are projections of V and NP, DP, and PP are projections of N. These syntactic categories can be distinguished in terms of the values 'lexical' and 'functional'. With respect to nominal projections, N is 'lexical' while D and P are 'functional'. Masullo assumes that both PPs and DPs are complete maximal projections, while NPs are defective projections. Masullo argues that bare singular count nouns are defective nominal projections, in other words, they are nominal projections that do not project to the maximal functional value (to DP).

There are two types of examples of bare singular count nouns that are relevant for this dissertation, bare singulars that incorporate into predicates, as in (21) and bare singulars that incorporate into light verbs as in (22).

(21)  Pedro compró        auto.

　　　P.     bought.PAST.3.SG car

　　　'Pedro bought a car.'

(22)  Pedro tiene         auto.

　　　P.     has.PRES.3. SG car

　　　'Pedro has a car.'

Unlike maximal nominal projections that can be licensed by structural case, Masullo argues that Spanish bare singular count nouns must be licensed by incorporation. In (21) the bare singular incorporates into a predicate that theta-marks it and assigns it inherent case. Given that there is no overt manifestation of this incorporation, Masullo assumes that incorporation occurs at LF. The examples in (23) and (24) show the steps of incorporation.

(23)  SS: Pedro [VP[V compró][NP auto]

　　　LF: Pedro [VP[Vcompró-auto$_i$]t$_i$]]

(24)    SS: Pedro [$_{VP}$[$_V$ tiene][$_{NP}$ auto]

LF: Pedro [$_{VP}$[$_V$ tiene-auto$_i$]t$_i$]]


Because the bare singular count noun is not a DP, it is not dominated by a $\phi$P and, for that

reason, has no number information associated to it. It is consistent with either a 'one' or

'more than one' interpretation. Unlike bare singulars, bare plurals can sometimes occur in

subject position and, for this reason, bare plurals appear to be full DPs.


(25)    a.    Llegaron    soldados a Santiago.

Arrived.3.PL soldiers  to Santiago

'Soldiers arrived in Santiago.'


b.    *Llegó        soldado a Santiago.

Arrived.3.SG soldier  to Santiago

'A soldier arrived in Santiago.'


Chapter 5 will present an experimental study on Chilean child interpretation of bare

singular count nouns vs. bare plural count nouns.

In summary, this syntactic account of the Spanish plural proposes that (1)

semantic number is represented on the $\phi$-head, which is the sister of DP, (2) nominal

number is interpreted indirectly through syntactic agreement between the $\phi$-head and

elements within the DP, and (3) bare singular count nouns are not dominated by a $\phi$P and,

as a result, are consistent with both an interpretation of 'more than one' and 'one'.


54

## 2.4    The Underlying Semantic Representation of the Spanish Plural

In this section I will provide a semantic representation for the feature [PL]. For the purposes of this dissertation, I will assume Ojeda's (1998) model-theoretic account of the notions of singularity and plurality. While there are many ways of dealing with the notions of singularity and plurality, Ojeda's proposal has an advantage in that it allows us to associate plurality with 'more than one'.

Ojeda (1998) discusses the interpretations assigned to singular and plural nouns through the use of mereologies. A mereology can be defined as a theory of parthood relations, of the relations of a part to a whole and the relations of parts to other parts within a whole. Schwarzschild (1996), for example, provides a set-theoretical account of plurals that links plurals to part structures in the sense that a set of individuals induces a larger domain that not only contains the individuals but also the sets formed from those individuals. Schwarzschild defines plurals as in (26).

(26)    If $\alpha$ is a singular common noun and $\beta$ is the plural of $\alpha$, the $\|\beta\|^M$ is the set of all non-empty subsets of $\|\alpha\|^M$.

This rule can be illustrated in example (27).

(27)    The boys clapped.

According to rule (26), 'boys' denotes the set of all non-empty sets of boys. In other words, 'boys' denotes not only the individuals, or singleton sets, but also all the sets formed from those individuals. We will see below that Ojeda departs from Schwarzschild by not allowing the singleton sets, or the individuals, to be included in the extension of the plural.

For the purposes of this dissertation, I will follow Ojeda in assuming that the plural does not include singleton sets.

Ojeda (1998) examines the notions of singularity and plurality expressed by nouns in Papago. In Papago nominal number is expressed through the rightward reduplication of the first syllable of the root as shown in (28)[9].

(28)  a.  bán (root)

          'coyote/coyotes'


      b.  bán

          'coyote'


      c.  bá-ban

          'coyotes'


Ojeda notes that nominal roots in Papago are generally associated with both a singular and plural reading.[10] To account for the plural and singular interpretation associated with roots he proposes that the nominal root can be represented by the mereology diagrammed in Figure 4, where the denotation of the root contains both the monoatomic and polyatomic elements of the mereology. The nominal root is associated to an interpretation of 'one' in the sense that its denotation contains the set of atoms (or monoatomic elements) of the

---

[9] Ojeda also discusses the notions of singularity and plurality expressed on verbs and the notions of distributivity expressed on both nouns and verbs. This will not be discussed here because it is not directly related to the experimental studies presented in this dissertation.

[10] Ojeda cites Wackernagel (1920) and (1883) as being among the first to observe these properties of nominal roots.

mereology and it is also associated to an interpretation of 'more than one' in the sense that

its denotation contains all of the polyatomic elements within the mereology.


Figure 4. Mereological Representation of a Nominal Root (adapted from Ojeda
1998).
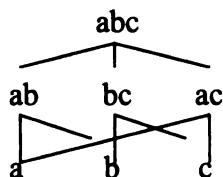
To account for the reduplicated nouns, as in (28c), which are associated to an

interpretation of 'more than one' in Papago, Ojeda proposes that the denotation of

reduplicated nouns (or plural nouns) contains only a part or subset of the denotation of

the root. The denotation of plural nouns in Papago contains "the set of sums of

nonidentical atoms in the denotation of its root" (p. 253). In other words, the denotation

for plural nouns contains the set of polyatomic elements of the root. This is represented

by the mereology diagrammed in Figure 5.


Figure 5. Mereological Representation of a Plural Noun (adapted from Ojeda
1998).
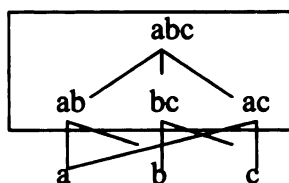
Finally, Ojeda notes that singular nouns in Papago denote the set of atoms in the

denotation; hence, they can be interpreted as the set-theoretical difference between the

denotation of their roots and the denotation of their plural counterparts. If the root is

represented as in Figure 4 and the plural as in Figure 5 then singular nouns in Papago can

be represented as in Figure 6.


Figure 6. Mereological Representation of a Singular Noun (adapted from Ojeda
　　　　　1998).
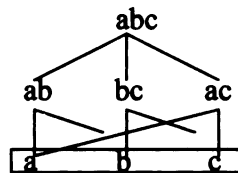


Under Ojeda's proposal, the singular arises as the complement of the plural and he notes

that his proposal captures the widely held intuition that plurality is about plural vs. non-

plural. Singular is what is left when plural is not present.

　　Ojeda's proposal for singular vs. plural in Papago can be applied to Spanish. I will

first start with Spanish bare singulars, proposing that their denotation is the same as for

Papago nominal roots, and then discuss Spanish plural and singular nouns. As noted in

Section 2.1 and Section 2.3 Spanish bare singular count nouns can occur as complements

of verbs and prepositions and are, for the purposes of this dissertation, analyzed as

incorporated nominals. Like Papago roots, Spanish bare singulars appear to be neutral

with respect to number distinctions, as illustrated by the translations of examples in (29).


(29)　　Tengo perro, tele, teléfono,　hijo.

　　　　I have dog,　tv,　telephone, child

　　　　'I have dog/dogs, tv/tvs, telephone/telephones, child/children.'

Notice that (29) is true if the speaker possesses 'one' or 'more than one' of these items. In (29) the bare singular indicates that the speaker is an owner of such objects (e.g. a dog-owner, tv-owner, etc.) and, hence, having 'at least one' (but possibly 'more than one') is sufficient for (29) to be felicitous. Given the number neutral characteristics of bare singulars, I would like to relate them to Ojeda's proposal for Papago nominal roots. Ojeda proposes that Papago roots are associated to a an interpretation of 'one' because their denotation contains the set of atoms in the mereology and are also associated to an interpretation of 'more than one' because their denotation contains a set of polyatomic elements in the mereology. I will assume that Spanish bare singulars have the same semantic representation as Papago root nominals. In other words, the denotation of Spanish bare singulars is as shown in Figure 4.

Unlike Spanish bare singulars, Spanish bare plurals seem to be associated primarily to an interpretation of 'more than one' but not to an interpretation of 'one', as illustrated by (30).

(30)    Tengo perros,  teles,  teléfonos,     hijos.

I have dogs.PL, tvs.PL, telephones.PL, kids.PL

'I have dogs, tvs, telephones, kids.'

Notice that (30) is true if the speaker possesses 'more than one' of these items but would be odd if the speaker possesses 'one' of the items. Hence, the examples in (30) suggest that the plural morpheme is associated to an interpretation of 'more than one' in Spanish.

Following Ojeda, we can represent the semantics of Spanish plural nouns as in Figure 5. Ojeda proposes that the denotation of the Papago plural contains the set of polyatomic elements. I will assume that Spanish plurals have the same semantic representation.

Turning now to the Spanish singular we find that the form of the noun is identical in phonological form to the Spanish bare singular but its semantic representation is different. According to Ojeda, "singulars can be interpreted as the set-theoretical difference between the denotation of their roots and the denotation of their plural counterparts" (p. 255). Hence, if Spanish bare singulars are represented as in Figure 4 and Spanish plurals is as in Figure 5, then the Spanish singular can be represented by Figure 6, which is the set of all on monoatomic elements. Given the representation in Figure 6, singularity is represented by all of the monoatomic elements, which are located in the lowest tier and the interpretation of the singular arises as the complement of the plural, as a contrast of plural vs. non-plural.

Based on Ojeda (1998), this section proposes the following about the semantic representation of Spanish plurality: (1) the Spanish bare singular is semantically represented as all the polyatomic and monoatomic elements in the mereology and is consistent with both an interpretation of 'one' and of 'more than one' (2) the Spanish plural is semantically represented as all of the polyatomic elements in the mereology and is to be associated to an interpretation of 'more than one' (3) the Spanish singular is semantically represented as the complement of the plural, in other words, as the set-theoretical difference between the denotation of the plural and the denotation of the root and is associated to an interpretation of 'one'.

## 2.5 Implications for Interpretation by Spanish Speakers

The discussion above assumes that Chilean and Mexican Spanish are equivalent with respect to the underlying syntactic and semantic representation for plural morphology but differ with respect to which phonological form of the plural morpheme agrees with or links to the φ-head. In Mexican Spanish both [s] and [z] agree with the [+PL] φP and hence are to be associated to an interpretation of 'more than one' while the absence of [s] and [z] (zero) shows agreement with an unmarked φP and are to be associated to an interpretation of 'one'. This is shown in (31) - (33).

(31)

```
          φP
         /  \
       φ      DP
     [+Pl]   /  \
            D    NP
```
*las* (the.PL)  *vacas* (cows.PL)

(32)

```
          φP
         /  \
       φ      DP
             /  \
            D    NP
```
*la* (the.∅)  *vaca* (cow.∅)

(33)

```
          φP
         /  \
       φ      DP
     [+Pl]   /  \
            D    NP
```
*vacas* (cow.PL)

61
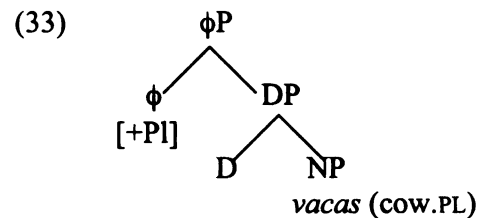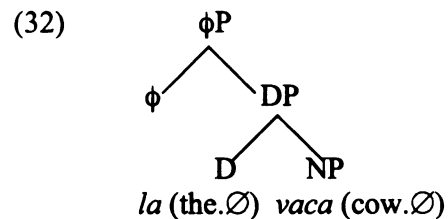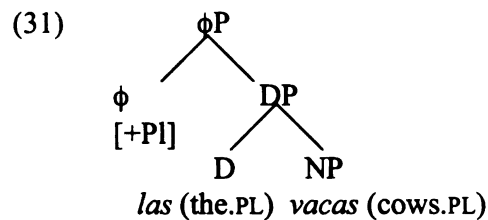
Bare singular count nouns are extremely restricted in Mexican Spanish and are almost absent.

In Chilean Spanish when the φ-head is [+PL] the determiner and the noun must agree with it and this agreement is spelled out as the phonological forms [s], [h], or zero. The absence of the plural morpheme, or the [zero] form, is also linked to an unmarked φ-head and, as a result, is also associated to an interpretation of 'one'. As a result, there appears to be an overlap in Chilean Spanish where the [zero] form may be linked to both a [+PL] φ-head and an unmarked φ-head and, as a result, be associated to an interpretation of 'more than one' or 'one', respectively. This idea is illustrated in (34) – (37).

(34)

φP
φ [+Pl]    DP
          D      NP
       *las* (the.PL)  *vacas* (cow.PL)

(35)

φP
φ [+Pl]    DP
          D      NP
   *las* (the.PL)  *vacah* (cow.PL)

(36)

```
        φP
       /  \
      φ    DP
    [+Pl]  / \
          D   NP
        las (the.PL)  vacaØ (cow.PL)
```

(37)

```
        φP
       /  \
      φ    DP
          / \
         D   NP
       la (the.SG)  vacaØ (cow.SG)
```
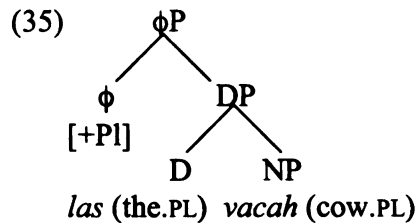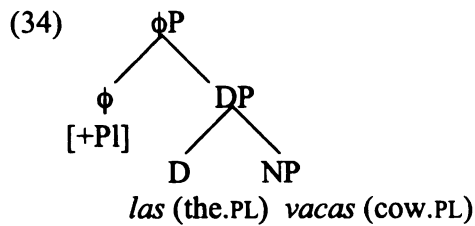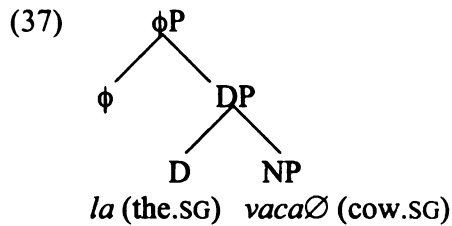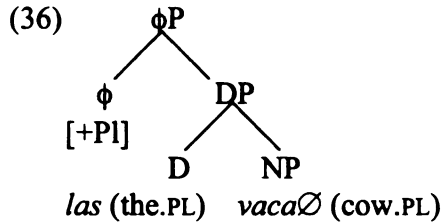
The examples in (34) - (36) suggest that [s], [h], and [zero] on the noun can be linked to a

[+PL] φ-head. (37) shows that the [zero] form can also be linked to an unmarked φ-head.

However, based on the adult Chilean data collected for this dissertation, we find that

there is generally some element within the plural DP that indicates plurality. This element

may be plural morphology itself, a numeral, a quantifier or the epenthetic [e] that surfaces

when the noun ends with a consonant (e.g. *peces* pronounced as [pese] instead of

[peses]). In rare cases, the context may be used to distinguish plural from singular. Table

10 provides some examples of Chilean adult production data.

Table 10. Chilean Adult Speech Samples.

|  | Plural ([s]/[h]) | Zero Plural Morpheme |
|---|---|---|
| **Definites** | mi-[h] niñita-[ø]<br><br>my.PL daughter.PL<br><br>'my daughters' | todo-[ø] lo-[ø] año-[ø]<br><br>all.PL    the.PL year.PL<br><br>'every year' |
| **Indefinites** | uno-[h]  año-[h]<br><br>some.PL years.PL<br><br>'some years' | uno-[ø]  mese-[ø]<br><br>some.PL months.PL<br><br>'some months' |
| **Quantifiers** | de toda-[h] manera-[ø]<br><br>in all.PL    cases.PL<br><br>'in any case' | todo-[ø] lo-[h] materiale-[h]<br><br>all.PL    the.PL materials.PL<br><br>'all of the materials' |
| **Nouns w/ Numerals** | treinta grado-[s]<br><br>thirty  degrees.PL<br><br>'thirty degrees' | uno se va    do-[h] mese-[ø]<br><br>one    goes two    months.PL<br><br>'one goes for two months' |
| **Nouns w/ Determiners** | una-[h]  muñeca-[s]<br><br>some.PL dolls.PL<br><br>'some dolls' | lo-[h] día-[ø]<br><br>the.PL days.PL<br><br>'the days' |

That data in Table 10 suggest that there is always something in the semantically plural

DP that indicates that a plural morpheme is present and hence that there is agreement

between this element and the [+PL] φ-head. We do not find instances in Chilean adult speech, for example, of semantically plural DPs that completely lack any plural number information whatsoever. For this reason, we must conclude that Chilean adult speakers associate the phonological variants [s] and [h], and sometimes zero, to an interpretation of 'more than one' as long as there is some information in the DP that shows that the φ-head is [+PL]. In addition, Chilean adult speakers can link inherently plural lexical items such as plural quantifiers and numerals to a plural morpheme that has undergone syllable-final /s/ lenition and, hence, to a [+PL] φ-head and assign that plural DP a 'more than one' interpretation.

Given the representation above, the interpretation that adult Mexican and adult Chilean speakers will assign to plural and singular noun phrases is discussed below. Let us first consider Mexican Spanish, as illustrated in the examples (38) – (41) below.

(38)  Pon unas      bolitas     en la  caja.

Put  some.F.PL marbles.F.PL in the box

'Put some marbles in the box.'


(39)  Pon una    bolita       en la  caja.

Put  a.F.SG marble.F.SG in the box

'Put a/one marble in the box.'

65

(40)   Dame    las      hormigas.

Give.me the.F.PL ants.F.PL

'Give me the ants.'


(41)   Dame    la      hormiga.

Give.me the.F.SG ant.F.SG

'Give me the ant.'


Adult Mexican Spanish speakers assign a plural interpretation to (38) and (40) because the plural morpheme /s/ indicates agreement with [+PL] φP and is associated to interpretation of 'more than one'. On the other hand, Mexican Spanish speakers assign an interpretation of 'one' to (39) and (41) because the absence of the plural morpheme indicates agreement with an unmarked φP.

The interpretation that Chilean adults would assign to plural and singular DPs is a little more complex. Given that number marking on the Spanish determiner, noun and adjective is the result of agreement with a [+PL] φ-head, it seems reasonable to assume that as long as one of the elements within the DP is marked with the plural morpheme [s] or [h], the adult would link that element with a [+PL] φ-head. As a result, the entire DP would be associated to an interpretation of 'more than one'. Consider the following sentences.

(42) Pon unas      bolita∅      en la  caja.

Put  some.F.PL marbles.F.PL in the box

'Put some marbles in the box.'


(43) Pon una    bolita      en la  caja.

Put  a.F.SG marble.F.SG in the box

'Put a/one marble in the box.'


(44) Dame    lah      hormiga∅.

Give.me the.F.PL ants.F.PL

'Give me the ants.'


(45) Dame    la      hormiga.

Give.me the.F.SG ant.F.SG

'Give me the ant.'


Adult Chilean speakers would assign a 'more than one' interpretation to (42) and (44) because there is at least one element within the noun that agrees with the [+PL] φ-head. However, they would assign an interpretation of 'one' to (43) and (45) because the absence of the plural morpheme on all elements within the DP agrees with an unmarked φ-head.

While the availability of the plural morpheme on at least one element within DP may be sufficient evidence for Chilean adult speakers in their interpretation of number, it

may not be sufficient for Chilean children in their early development of plural morphology. The task of acquiring plural morphology requires Chilean children to acquire the forms associated to plural morphology, acquire the sociolinguistic variation associated to the different forms, and use plural morphology to interpret the contrast between 'one' vs. 'more than one'. For Mexican Spanish this seems straightforward since both [s] and [z] consistently map to a [+PL] $\phi$-head in the input (adult E-language) and the alternation between [s] and [z] is categorical, hence there is not no sociolinguistic variation to acquire. Furthermore, there is no ambiguity. However, for Chilean children the task seems a bit more complex. Chilean children must link the phonological forms [s] and [h] to [+PL] $\phi$-head in order to use plural morphology to interpret the contrast between 'one' vs. 'more than one'. They must also realize that [zero] can link to a [+PL] $\phi$-head, as long as there is something else in the DP that marks plurality (e.g. a plural morpheme, quantifier, numeral). Because [zero] also agrees with an unmarked $\phi$-head and is associated to an interpretation of 'one' there appears to be some ambiguity in the input that Chilean children receive. In Chapter 4 and Chapter 5 I will present a series of experiments on Mexican and Chilean Spanish-speaking children that investigate how these different types of input affect their production and comprehension of plural morphology.

# CHAPTER 3

## PREVIOUS LANGUAGE ACQUISITION RESEARCH

### 3.0    Introduction

This thesis is working from the assumption that language acquisition involves two main interacting components: (1) an innate language acquisition device (LAD) and (2) linguistic experience (input), I further assume that, while the LAD is generally invariable across typically-developing human populations (all typically-developing humans have the ability to acquire language), the linguistic experience or input varies across and within human populations, to the extent that even the linguistic experience of two siblings differs, just not to the extent of creating unintelligible languages. This dissertation is primarily concerned with the second component, the linguistic input and the underlying research question is not simply how many tokens does a child need to be exposed to in order to acquire a grammar that matches the adult grammar but rather how many variable tokens (including zero tokens) can children support before they construct a grammar that does not match the adult grammar?

Previous studies examining the effect of input on language development have been primarily focused on the frequency of a particular morpheme in language. This type of research is often carried out by cross-linguistic comparisons (Slobin 1985, Lillo-Martin and Snyder 2002, Kupisch 2006) but it has also been done by comparing the development of different grammatical morphemes (that occur at different levels of frequency) within one language. For example, Brown (1973) compared the order of grammatical morpheme acquisition in children to the frequency of grammatical morphemes in adult speech and found that the grammatical morphemes that are more

frequent in the adult speech are acquired more quickly by children. Brown found that the plural morpheme was more frequent than the possessive morpheme in adult speech and English-speaking children likewise acquired the plural morpheme /s/ before the possessive morpheme /s/. Frequency studies of this sort, while very informative, appear not to take into consideration neither the different complexities of the grammatical elements being compared nor the *reliability* of the input with respect to the grammatical morphemes under consideration. For example, while the plural morpheme /s/ is almost always present when plurality is expressed in Standard English, there are cases when it is not (e.g. children, teeth, sheep) and there are cases where it is present and does not mean 'more than one' (e.g. scissors, pants). It is interesting to note that these exceptions appear to be tolerated by English-speaking children and do not appear to pose a great problem.

However, we could imagine other situations where the input is much more variable, as is the case when we encounter sociolinguistic variation. For example, if we were to examine the development of another property of English that seems to have a much more variable behavior, as appears to be the case with the production of auxiliaries by adult English speakers, we would need to consider not only the frequency of auxiliary production but also the reliability of that production. Examples (1) – (7) in Table 11 show that the production of auxiliaries in English is variable.

Table 11. Variation in Auxiliary Production.

|  | **Standard**<br>**Production of Auxiliary** | **Nonstandard**<br>**Omission of Auxiliary** |
|---|---|---|
| (1) **Did she eat?** | a. Did she eat? | b. She eat? |
| (2) **Does she eat carrots.** | a. Does she eat carrots? | b. She eat carrots? |
| (3) **Do you like carrots?** | a. Do you like carrots? | b. You like carrots? |

|  | **Standard**<br>**Agreement** | **Nonstandard**<br>**No Agreement** |
|---|---|---|
| (4) **Doesn't she know?** | a. Doesn't she know? | b. Don't she know? |
| (5) **She doesn't like him.** | a. She doesn't like him. | b. She don't like him. |
| (6) **She does like him.** | a. She does like him. | b.*She do like him. |
| (7) **Does she like carrots?** | a. Does she like carrots? | b. *Do she like carrots? |

The paradigm above shows that auxiliaries can be omitted and may or may not be

inflected for agreement in some non-standard varieties of English. The omission and lack

of agreement is both linguistically (e.g. questions, negation, declaratives) and extra-

linguistically constrained (e.g. social class, speech style). The only unacceptable

examples in adult speech are those starred examples in (6b) and (7b). Given two children,

Child A and Child B, with Child A being exposed to a variety of English which prefers omission of the auxiliary and no agreement between the auxiliary and the subject while Child B being exposed to a variety of English which prefers production of the auxiliary and Subject-Aux agreement, we might predict that the underlying systems that are initially constructed by Child A and Child B may be different, even though Child A and Child B are exposed to all of the forms above, just at different frequencies. Would it be possible to detect this underlying grammatical difference between Child A and Child B in their speech? Given that the input to Child A would contain less agreement and more omissions, there would be very little evidence for the auxiliary 'does' and hence this might predict that Child A would produce sentences like (6b) and (7b) while Child B would not. Already, research on middle-class English-speaking children has shown that sentences like (6b) and (7b) are unattested in child speech (Guasti and Rizzi 2002, Schutze 2006). However, if sentences like (6b) and (7b) are found in the speech of children whose parents sometimes omit the auxiliary, it would suggest that both the *properties* of the input and the *frequency* of such properties are relevant for determining the course of development of any grammatical feature.

There have been a few studies that have taken both the properties and frequency of the input into consideration. However, studies of this sort are very rare. Those that exist have been carried out mainly in the field of sociolinguistics and SLI research and can be classified as one of two types: (1) as comparing the development of Form A to Form B in a particular context when the input provides evidence for both at varying degrees (Park 1978, Gathercole 1986, Kopcke 1998) and (2) examining the development of Form A when the input provides both evidence for (overt realization of the form) and

evidence against (e.g. omission of the form) this form (Ramer and Rees 1973, Moore 1979, Kovac 1981, Johnson 2005, Hudson Kam and Newport 2005). Research that examines both the frequency and reliability of the input on language development then poses a different research question than has previously been proposed in frequency studies. As noted above, the research question is not simply how many tokens does a child need to be exposed to in order to acquire a grammar that matches the adult grammar but rather how many variable tokens (including omitted tokens) can children tolerate before they construct a grammar that does not match the adult grammar?

This chapter is set up as follows: First, I will present previous research on the production of plural morphology in English-speaking and Spanish-speaking children who are exposed to an input with systematic plural marking. I will discuss both free speech and elicitation tasks. It is important to compare both languages given that Spanish marks plural on all elements within the determiner phrase while English generally only marks plural on the noun. The purpose of this first section is to see whether acquisition of the plural morpheme will be the same in both languages as long as the input is systematic. Secondly, I will discuss research that has examined where in the determiner phrase Spanish-speaking children initially place the plural morpheme. Third, I will present previous research on the comprehension of plural morphology in English-speaking children who are exposed to an input with systematic plural marking. Only research with English-speaking children will be discussed because, as far as I know, there are no studies on the comprehension of plural morphology by Spanish-speaking children who are exposed to systematic plural marking in the input. Finally, I will present previous research on the acquisition of variable input and also research on the acquisition of

inconsistent input and discuss how exposure to variable vs. inconsistent input makes

different predictions for language acquisition.

## 3.1    Acquisition of Plural Morphology

### 3.1.1    Production of Plural Morphology

What do we know about the production of the plural morpheme by children in

languages like English, where the plural morpheme is only marked on the noun, vs.

standard varieties of Spanish, where the plural morpheme is marked on all elements

within the determiner phrase? This question is important because it may be the case that

the more redundant the plural marking is (i.e. marked on various elements within the

determiner phrase), the quicker children will acquire plural morphology in their own

language. One could argue that the plural morpheme is more frequent in Spanish than in

English because in Spanish the plural morpheme occurs on all elements within the

determiner phrase. This is especially important for this dissertation given that Mexican

Spanish will have more redundancy in plural marking than Chilean Spanish because

Chilean Spanish-speaking adults omit the plural morpheme on various elements within

the determiner phrase. If redundancy facilitates plural morpheme development, then we

would expect both Chilean and Mexican Spanish-speaking children to acquire plural

morphology earlier than English-speaking children and, likewise, we would expect

Mexican children to acquire plural morphology before both Chilean children and

English-speaking children. Even if Chilean Spanish-speaking adults omit the plural

morpheme some of the time, they will still produce it on more elements within the

determiner phrase than English-speaking adults. This section will examine the production

of plural morphology in Spanish and English varieties where the plural morpheme is systematically produced in the adult speech.

It has been reported for English that the plural morpheme is the first bound morpheme that children produce in the noun phrase[11] (Brown 1973, de Villiers and de Villiers 1973). In free speech, English-speaking children start producing the plural morpheme systematically on all semantically plural nouns by approximately 2 years of age (Cazden 1968, Mervis and Johnson 1991). In addition, Mervis and Johnson found that the only errors in free speech that their 1;7 year old English-speaking subject produced with respect to the plural morpheme were over-regularization errors where the child added -s to an irregular plural noun ("sheeps", "mens") or omitted the final /s/ from a semantically singular noun ("scissor" instead of "scissors"). In other words, by 1;7 years of age this child produced the plural morpheme on semantically plural nouns more than 90% of the time.

In addition to free speech, elicitation tasks have been carried out to test child production of the plural. Berko (1958) tested child production of the three allomorphs of the English plural morpheme by eliciting plural nouns from children between the ages of 4 – 7. Children were shown a picture of one novel object (Figure 7) followed by a sentence like (8a). Next, they were shown two of the objects and asked to complete the sentence in (8b).

---

[11] Brown (1973) and Cazden (1973) considered that a child had acquired the morpheme when it was produced at least 90% of the time in obligatory contexts.

Figure 7. The Wug Test (Berko 1958).
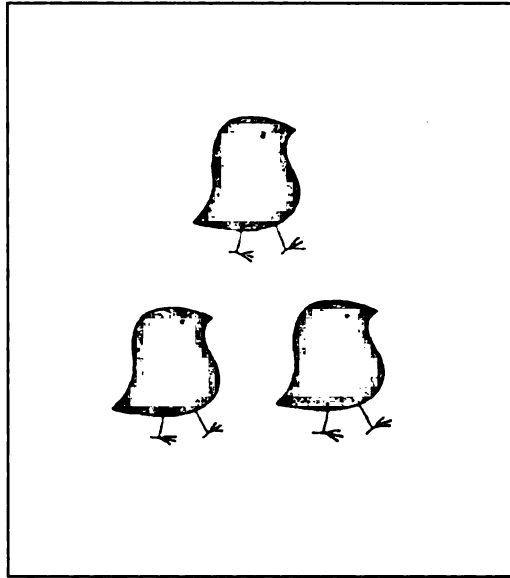


(8)    a.    This is a wug.

       b.    Now there are two of them. There are two _____ .


This technique allowed Berko to elicit the plural morpheme in several phonetic

environments in order to see whether children produced the correct allomorphs of the

plural morpheme ([s], [z], [əz]). Importantly, the plural form of both real words and novel

words was elicited from children in order to ensure that children's use of the allomorphs

was productive. The findings of Berko's experiment revealed that children had little

difficulty providing the plural allomorphs [s] and [z] with both real and novel words.

However, while they were able to produce the plural allomorph [əz] with real words, they

were not able to do so with novel words. While this study shows that children use the

plural morpheme (and at least the two plural allomorphs [s] and [z]) productively, it does

not show whether children use the plural morpheme in contexts associated to an

interpretation of 'more than one'. Given the nature of the task, the fact that children had to produce a plural noun after a numeral, it is possible that children are simply making the noun agree with the numeral, not really comprehending that the plural morpheme can be used to indicate 'more than one'.

In a different type of elicitation task, Ferenz and Prasada (2002) elicited the plural morpheme on definite noun phrases and noun phrases preceded by quantifiers and numerals with 48 Mainstream English-speaking children ages 1;9 – 5;6. For the definite noun phrase condition, there were two stories: (1) Singular Story: Big Bird told a joke to one cat and (2) Plural Story: Big Bird read a story to several frogs. The children were then asked to say what happened by completing sentences: (1) Big Bird told a joke to the cat_ (singular noun) and (2) Big Bird read a story to the _frogs_ (plural noun). Since the definite determiner in English provides no number information, children who produce the plural morpheme in the plural condition, but not in the singular condition, demonstrate that they are associating the plural morpheme to an interpretation of 'more than one'. Their findings showed that 47 out of 48 children produced the plural morpheme in the plural condition and only 1 out of 48 produced the plural morpheme in the singular condition. This experiment indicates that English-speaking children produce the plural morpheme to express the meaning of 'more than one' by 2;0 years of age. Additionally, these same children showed that they systematically produced plural nouns when the noun was preceded by quantifiers and plural numerals.

Next, we turn to the production of plural morphology by Spanish-speaking children. First, we will discuss the production of plural morphology in free speech and then in elicitation tasks. For comparative purposes, we want to see whether Spanish-

77

speaking children with redundant plural marking begin to produce plural morphology at the same time or before English-speaking children, who are exposed to non-redundant plural marking. In other words, we are interested in whether Spanish-speaking children start producing the plural morpheme by at least 2 years of age.

Kvaal et al. (1988) collected spontaneous speech samples from 15 Mexican-American Spanish-speaking monolingual working-class children between the ages of 2;0 – 4;8 who lived in or around San Diego, California. They showed that children began producing the plural morpheme by 2;0 years of age. Their findings are consistent with a similar study by Marrero and Aguirre (2003) who found that two Peninsular Spanish-speaking children living in Madrid started producing the plural morpheme by 1;9 years of age (see Section 3.1.4 for details associated to variation). Although the authors did not mention whether these Spanish-speaking children were acquiring a variety of Spanish with syllable final /s/ lenition, it does appear that Madrileño Spanish and several varieties of Mexican Spanish do not have syllable final /s/ lenition (Lipski 1994, Barrutia et al. 1994). On the other hand, Vivas (1979) found that four Spanish-speaking immigrant children living in Colorado (USA) did not begin producing the plural morpheme on plural nouns until around 2;4 years of age and only did so on semantically plural nouns between 50% (7/14) – 65% (13/20) of the time. Even by 3;5 years of age, one Spanish-speaking child produced the plural morpheme on plural nouns only 83% of the time. Their findings show a gradual increase in usage of the plural morpheme and at the same time show that Spanish-speaking children as old as 3;5 still omit the plural morpheme approximately 20% of the time. They suggested that the omission of the plural morpheme (approximately 20% of the time) may possibly be due to the aspiration of the plural

morpheme in some dialects of Latin American Spanish; however, they provided no information about the extent to which the plural morpheme was aspirated in the linguistic input these children were exposed to. In any case, these studies examining the free speech of Spanish-speaking children suggest that when the plural morpheme is systematically produced in the adult speech, Spanish-speaking children, like English-speaking children, begin using the plural morpheme by at least 2;0 years of age. From these studies we have no evidence that the plural morpheme shows up earlier in the free speech of Spanish-speaking children and hence have no evidence that redundancy of plural marking provides a benefit for acquiring plural morphology.

Subsequent to the publication of Berko (1958), several researchers began to carry out similar studies in a variety of languages using the Berko elicitation technique described above. I will outline here those experiments that were carried out with Spanish-speaking children. Kernan and Blount (1966) tested 92 5-12 year old working-class Mexican Spanish-speaking children from the city of Guzman in the state of Jalisco, Mexico on a Berko style task that required children to provide the plural forms of singular novel nouns. Subjects were shown novel objects and told *"Este es un fetor. Ahora hay otro. Hay dos de ellos. Hay dos _____."* ("This is a fetor. Now there is another one. There are two of them. There are two _____."). While 18 adults (from the same community) provided the correct plural forms 100% of the time on novel words for both the [s] and [es] forms of the plural, children produced the correct plural 93% - 100% of the time on novel words requiring the [s] form but only between 38% (for the younger children) to 53% (for the older children) of the time for novel words requiring the [es] form. When the [es] form was required, children generally just omitted it,

although a few children incorrectly produced the plural form of the word with [s] (e.g. *fetors*).

In an almost identical task[12], Perez-Pereira (1989) showed that for real and novel words requiring the [s] form, 109 3 – 6 year old Spanish-speaking children from La Coruña, Spain (in Galicia) produced the plural morpheme more than 92% of the time. However, for words requiring the [es] form (e.g. real words: *flor* 'flower', *arbol* 'tree', *autobus* 'bus'; novel words: *sibil, tipon, patus, astor*), children provided the plural morpheme for real words between 76% (for 3 year olds) to 100% (for 4, 5, 6 year olds) of the time but only provided the correct form for novel words between 36% (for 3 year olds) to 55% (for 6 year olds) of the time. The most common mistakes in both studies consisted of using the form [s] instead of [es] or simply repeating the word in its singular form with no plural morpheme (especially when the novel word already ended in [s]). These findings are consistent with what Berko (1958) found for English-speaking children.

The experiments reported in Kernan and Blount (1966) and Perez-Pereira (1989) show that by at least 3 years of age, Spanish-speaking children produce the plural morpheme on nouns that follow quantifiers; however, their studies do not show that Spanish-speaking children use the plural morpheme to express the meaning of 'more than one'. Instead, it may simply be the case that children are making the noun agree with the plural numeral or quantifier.

---

[12] Researcher showed child real and novel objects and said, *"Esto es un globo. Ahora hemos puesto otro más. Ahora hay dos _____."* ("This is a balloon. Now we have put one more here. Now there are two _____.").

One study that provides more information about the interpretation that Spanish-speaking children assign to the plural morpheme was carried out by Bedore and Leonard (2001), who examined the production of plural morphology in SLI (Specific Language Impairment) and typically developing Mexican Spanish-speaking working-class children living in the metropolitan area of San Diego, California. Children were acquiring Spanish as their first language and had minimal contact with English. Although they do not mention whether these children were acquiring of dialect of Spanish subject to syllable final /s/ lenition, we do know that several varieties of Mexican Spanish do not allow syllable final /s/ lenition (Lipski 1994). 45 children participated in the study: 15 SLI children, 15 typically developing age matched controls (4;0 – 5;6), and 15 typically developing MLU matched controls (2;4 – 3;10). There were several tasks that required children to produce the plural forms [es] and [s] with real words. I will discuss only the two that are relevant for this dissertation. In the first task the researcher showed children pictures of plural and singular objects and asked the child, *"¿Qué hay aquí?"* ("What is/are here"). Importantly for this task, the Spanish existential *'hay'* ('there is/are') does not have any number information associated with it; it is used with both plural and singular nouns, as shown in (9) and (10) below.


(9)     Hay     un        elefante     en el  patio.

        There-is an/one.SG elephant.SG in the backyard

        'There is an elephant in the back yard.'

(10)   Hay       elefantes   en el  patio.

         There-are elephants.PL in the backyard

         'There are three elephants in the backyard.'

This means that children who produce plural nouns may not be doing so for reasons of agreement (i.e. agreement between the verbal existential predicate and the NP) but rather because they associate the plural morpheme with an interpretation of 'more than one'. The results of their study showed that 4;0 – 5;6 year old typically developing children produced the plural morpheme on real word nouns when presented with pictures of plural objects 96% of the time, the 2;4 – 3;10 year old typically developing children did so 75% of the time but the SLI children only 56% of the time. The differences between the three groups were significant. Child errors always consisted of children omitting the plural morpheme on the noun when presented with a plural picture. These results indicate that by at least 4;0 years of age, most Mexican Spanish-speaking children produce the plural when describing plural sets.

One problem with Bedore and Leonard's (2001) study is that it is unclear from the way the results are presented whether children were producing bare plurals, indefinite plurals or 'quantifier + plural noun' constructions to describe pictures of plural sets of objects. For this reason, there is no way of telling whether children are using the plural morpheme to express 'more than one' or if they are using a lexical determiner to express 'more than one' and the plural morpheme surfaces through agreement. For example, if children produced *'una vaca'* (a/one.SG cow.SG) for a picture of a single cow and *'unas vacas'* (some.PL cows.PL) for a picture of several cows, the only difference between the

two responses being the plural morpheme –s on the noun and the determiner, then it would appear that children are aware that the plural morpheme is associated to an interpretation of 'more than one'. However, if a child produces *'una vaca'* (a/one.SG cow.SG) for the singular picture and *'vacas'* (cows.PL) for the plural picture, we cannot conclude that the plural morpheme is being used to distinguish plural from singular given that the plural morpheme is not the only difference between the two responses given by this child. It is important to note that, in a separate task, Bedore and Leonard attempted to elicit just indefinite plurals (e.g. *unas vacas* 'some.PL cows.PL') but children did not produce just indefinite plurals, rather they also produced bare plurals, which indicates that children most likely produced both indefinite plurals and bare plurals in the task just described above, but it is unclear to what extent. In any case, it can be concluded from Bedore and Leonard's results that by 4;0 years of age most typically developing Mexican Spanish-speaking children use the plural morpheme in plural noun phrases.

Cantú-Sánchez and Grinstead (2004) carried out an experiment with 10 SLI (specific language impairment) Spanish-speaking children and 20 typically-developing 4-year old (10 age-matched, Mean Age: 4;7 and 10 MLU matched, Mean Age: 4.0) Spanish-speaking children from Mexico City. The experiment was similar to that of Bedore and Leonard (2001) in that it elicited singular and plural nouns without providing any number information in the experimental question. The researcher presented a picture of a single object to children followed by a picture of two objects and said, *"Aquí tengo una mariposa. ¿Y, aquí?"* ("Here I have a/one butterfly. And here?"). The results showed that the typically-developing MLU-matched children (Mean Age: 4;0) produced the plural forms [s] and [es] on real word nouns on average about 97% of the time and the

typically-developing Age-matched children (Mean Age: 4;7) produced the plural forms [s] and [es] on real words approximately 93% of the time. The SLI children only produced the plural morpheme on average about 82% of the time. Cantú-Sánchez and Grinstead's (2004) results are in line with those of Bedore and Leonard (2001), showing by at least 4 years of age, Mexican Spanish-speaking typically-developing children produce the plural morpheme systematically when describing plural sets.

The studies presented here show no difference between Spanish-speaking and English-speaking children with respect to when they begin to produce the plural morpheme. Although the age groups in each study differ, there is evidence that both English-speaking and Spanish-speaking children start producing the plural morpheme by at least 2;0 years of age and that by 4;0 years of age they are producing plural morphology systematically. This indicates that redundancy in plural marking does not facilitate (nor hinder) the acquisition of the production of plural morphology. Instead, it appears that as long as the evidence for plural morphology is systematic in the adult speech, English-speaking and Spanish-speaking children (1) start producing the plural morpheme by at least 2;0 years of age, (2) use the plural morpheme productively on real words by at least 4;0 years of age (most likely earlier) at least after quantifiers and numerals and (3) at least English-speaking children (there are no studies for Spanish-speaking children) use the plural morpheme to express the meaning of "more than one" by 1;9 years of age.

### 3.1.2 Placement of the Plural Morpheme in Production

Given that previous studies suggest that Spanish-speaking children start to produce the plural morpheme by two years of age, another important question is whether

Spanish-speaking children start out placing the plural morpheme on all elements within the determiner phrase (i.e. the determiner, noun, and adjectives) or whether they start out placing the plural morpheme on only one element within the determiner phrase. Furthermore, if they place the plural morpheme on only one element within the determiner phrase, where do they place it and is this placement systematic in the speech of children?

Although there are very few studies examining where Spanish-speaking children initially place the plural morpheme, there is some evidence that 1;6-2;0 year old Spanish-speaking children initially start out placing the plural morpheme only on the noun and then by 2;1-2;6 they begin to extend the plural morpheme to the determiner, marking both the determiner and the noun with the plural morpheme (Marrero and Aguirre 2003).

Similar findings were reported for children acquiring a dialect of Brazilian Portuguese (BrP) in which in the researcher reports that in the adult speech the plural morpheme is always placed on the determiner and sometimes omitted on the following noun and adjectives (Vasconcellos Lopes 2006). Vasconcellos Lopes reports that two Brazilian children at about 2;5 years of age produced the plural morpheme on the noun and not the determiner in as many as 35% of all DPs. This finding is interesting given that Vasconcellos Lopes also reports that in the adult speech the plural morpheme is systematically placed on the determiner and optionally placed on the noun. Samples of child speech taken from Vasconcellos Lopes is shown in (11).

(11) a. a hienas (Child Age: 2;4)

the.SG hyenas.PL

'the hyenas'


b. meu chinelinhos (Child Age: 2;6)

my.SG slippers.PL

'my slippers'


c. o patinhos (Child Age: 2;6)

the.SG duckies.PL

"the duckies"


According to Vasconcellos Lopes, the child utterances shown in (11) are not attested in the dialect of BrP adult speech these children were exposed to.

Cantú-Sánchez and Grinstead's (2004) had a second experiment that looked at placement of the plural morpheme by 10 SLI and 20 typically-developing 4 year old (10 age-matched, Mean Age: 4;7 and 10 MLU matched, Mean Age: 4.0) Spanish-speaking children from Mexico City. Children were shown a picture of a single object (e.g. a red flower) followed by a picture of multiple objects (e.g. several yellow flowers). The researcher would say, *"Aquí hay una flor roja. ¿Y aquí?"* ("Here there is a/one red flower. And here?"). The intention of the experiment was to elicit plural 'N + Adj.' constructions (e.g. *flores amarillas* 'yellow.PL flowers.PL'). The results showed that typically-developing Spanish-speaking Age-matched children and MLU-matched

children produced the plural morpheme on both the noun and adjective on average 98% of the time. The SLI Spanish-speaking children produced the plural morpheme on both the noun and adjective approximately 90% of the time.

It is difficult to compare the findings of Cantú-Sánchez and Grinstead (2004) with the findings of Vasconcellos Lopes (2006) and Marrero and Aguirre (2003) because of the differences in age. It is most likely the case that the children in Cantú-Sánchez and Grinstead (2004) produced more plural marking because they were older. However, the findings of these three studies suggest that (1) whether plural marking is systematic in adult speech (as in Madrileño adult Spanish) or whether it is variable in the adult speech, with number marking always occurring on D and optionally on N (as in the variety of BrP studied by Vasconcellos Lopes 2006), Spanish-speaking children may initially start out placing the plural morpheme mainly on nouns and (2) by 4;0 years of age, Spanish-speaking children acquiring a variety of Spanish with systematic plural marking (as in the Spanish of Mexico City) have learned to produce the plural morpheme on all elements (or at least more than one element) within the DP.

### 3.1.3 Comprehension of Plural Morphology

The following studies will present research on the comprehension of plural morphology by English-speaking children where the plural morpheme is systematically produced in the adult speech. As far as we know, there is only one experimental study of the comprehension of plural morphology in Spanish-speaking children. However, we will discuss this study later in the chapter because it was carried out in a variety of Spanish where the plural morpheme is generally omitted in the adult speech.

87

In order to determine whether young children were sensitive to the syntactic constraints of plural morphology, Gouvea et al. (2005) examined whether 1;6 year old English-speaking children were sensitive to ungrammaticalities involving the plural morpheme. In a Headturn Preference Procedure children were tested on their preference for passages containing the plural morpheme in *grammatical* noun phrases involving definite determiners (e.g. the dogs, the babies) vs. passages containing the plural morpheme in *ungrammatical* noun phrases involving indefinite determiners (e.g. a dogs, a babies). Their findings showed that children looked longer at grammatical passages than at ungrammatical passages. Although this study does not tell us whether 1;6 year old children associate meaning to the plural morpheme, it does indicate that by 1;6 years of age, children are sensitive to the syntactic restrictions of the plural morpheme. In any case, Gouvea et al. note that their findings must be interpreted with caution given the experimental set up. In their study the ungrammatical passages always involved indefinite noun phrases while the grammatical passages always involved definite noun phrases. For this reason, it is unclear whether children simply had a preference for sentences involving definite noun phrases over indefinite noun phrases.

Kouider et al. (2006) investigated the comprehension of the plural morpheme on novel words in 1;6 – 3;0 year old English-speaking children using a Headturn Preference Procedure where children listened to sentences involving plural and singular nouns and were measured on how long they looked at pictures involving plural sets vs. singular sets. The purpose of this experiment was to determine whether English-speaking children associate the plural morpheme to the interpretation of 'more than one'. Importantly, the

ages of the children in this experiment parallel the age at which children begin to produce plural morphology in free speech.

In Kouider et al.'s first experiment children were tested on sentences like *Look, there are some blickets* vs. *Look, there is a blicket,* where the noun, determiner and verb all provide number information. Children were presented with two screens, one displaying a singular novel object and one displaying a plural set of novel objects, while they listened to sentences. Their findings showed that by 2;0 years of age, but not 1;6 years of age, children looked at the screen that matched the target sentence for a longer period of time. Because the determiner and verb also had number information, it is not clear from this experiment whether 2;0 year old children associate the interpretation of 'more than one' with only the nominal plural morpheme. For this reason, in a second experiment, children were tested on sentences like *Look at the blickets* vs. *Look at the blicket,* where the only difference between the singular sentence and the plural sentence is the presence of the nominal plural morpheme. If children treat these sentences differently, associating the plural sentence with the plural picture, this would indicate that they comprehend the plural morpheme as associated to the interpretation of 'more than one'. Their results showed that by 3;0 years of age, but not 2;0 years of age, children looked longer at the screen that matched the target sentence.

While these two experimental studies do suggest that at least by 3;0 years of age, English-speaking children associate the plural morpheme to the interpretation of 'more than one', because of the difficulty of the task, they do not necessarily show that younger children (children under 3;0 years of age) do not associate the plural morpheme to the interpretation of 'more than one'. The experimental task involved novel nouns and novel

pictures. It seems reasonable that children would look at either set of pictures given the plural or singular noun. In fact, it seems that looking at the plural picture even in the singular noun condition is a correct response since the child could be looking at only one of the many novel objects presented in the plural picture. For this reason, it is very interesting that 3;0 year old children did so well and suggests very strongly that at least by 3;0 years of age, and possibly earlier, that English-speaking children associate the plural morpheme to the interpretation of 'more than one'.

It is important to note that the Kouider et al. (2006) study used an indirect testing method in order to detect implicit understanding of the plural morpheme in children. Children listened to sentences with plural and singular noun phrases and experimenters measured where and how long they looked. However, children were not given any explicit instructions about the task. While this study shows that 3;0 years have an implicit knowledge of the plural morpheme, it does not show whether they have explicit knowledge of the plural morpheme. In other words, can children use the presence or absence of the plural morpheme when making conscious decisions about number? The only study that we are aware that tests explicit knowledge of the plural morpheme in comprehension was carried out by Munn et al. (2006). In an Act-out task, 15 3;0-5;5 (Mean Age: 4;1) year old English-speaking children were tested on their comprehension of the plural morpheme in definite noun phrases in sentences like *Give me the frog next to the barn* vs. *Give me the frogs next to the barn* in a context as in Figure 8.

Figure 8. Experimental Display in Munn et al. (2006).

| House FrogA FrogB FrogC | Frog3 Frog2 Frog1 Barn |
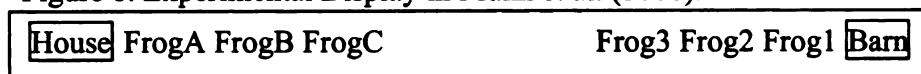
*Adapted from Munn et al. (2006).

90

Given the context in Figure 8, if children hear the sentence *Give me the frog next to the barn* with the singular noun phrase, they should choose Frog1. If they hear the sentence *Give me the frogs next to the barn* with the plural noun phrase, they should choose at least two or more of the frogs labeled with numerals, if we do not consider the role of the definite. The second set of frogs (labeled with letters) is included in order to make the sentence with the plural noun phrase felicitous. In other words, modification of the plural set is only necessary if there is an alternative set of frogs included in the display. Munn et al. found that English-speaking children performed correctly on both the plural and singular sentences about 80% of the time indicating that when plural morphology is systematically marked in the adult speech, English-speaking children have explicit knowledge of the plural morpheme as associated to an interpretation of 'more than one' by at least 4;0 years of age.

In addition to being associated to the interpretation of 'more than one', the plural morpheme is also associated with count nouns but not mass nouns. From the studies presented thus far it is unclear whether English-speaking children associate the plural morpheme with the count-mass distinction. To test this, Barner and Snedeker (2005) examined 4;1 – 4;6 year old English-speaking children on their comprehension of sentences like *Who has more string* vs. *Who has more strings*, in a context where one character always has a single large object (e.g. a long string) while the other character has three small objects (e.g. three short strings) of the same kind. The three objects had a smaller combined volume and surface area than the large object. The only difference between the mass vs. count nouns was the presence or absence of the plural morpheme. The findings showed that children treated the plural count nouns differently from the

mass nouns, indicating that in addition to the 'more than one' interpretation, by 4;0 years

of age English-speaking children also associate the plural morpheme only to count nouns.

In summary, the findings of the above studies examining the comprehension of

plural morphology in English-speaking children indicate that children associate the plural

morpheme to the interpretation of 'more than one' by at least 3;0 years of age (implicitly)

and that, furthermore, they associate the plural morpheme to count nouns, and not mass

nouns, at least by 4;0 years of age.

## 3.2    Acquisition of Variable Input

Up to this point, the research presented in this chapter indicates that when plural

morphology is systematically produced in the adult speech, both Spanish and English-

speaking children begin producing the plural morpheme by at least 2;0 years of age and

English-speaking children (for Spanish-speaking children see Chapter 5) appear to

associate the plural morpheme to the interpretation of 'more than one' as early as 3 years

of age. In this section, I will first discuss acquisition of the plural morpheme when plural

morphology is variable in the adult speech. Next, I will discuss research that has

examined the development of other grammatical and phonological features when the

adult input is variable. Finally, I will present research that has examined the effect of

inconsistent input on language acquisition and discuss the differences between first

language acquisition of inconsistent input vs. first language acquisition of variable input.

In addition to examining plural morpheme production in two Madrileño children,

as noted above, Marrero and Aguirre (2003) also examined the production of plural

morphology in one Canary Island Spanish-speaking child and found that unlike the

Madrileño Spanish-speaking children, the Canary Island child did not start producing

plural morphology until 3;0 years of age and, at that time, still omitted the plural morpheme about 20% of the time. They suggested that this delay and subsequent omission of plural morphology might be due to the aspiration of the plural morpheme in dialects of Canary Island Spanish; however, they provided no details about the linguistic input this particular child was exposed to. This finding, although based on only one child, is comparable to those findings reported in Vivas (1979) above, where a 2;5 year old child still omitted the plural morpheme approximately 50% of the time and a 3;5 year old child omitted the plural morpheme approximately 20% of the time. It is interesting that, while neither study examined the input these children were exposed to, both studies suggested that the later development of plural morphology in these children might have been related to syllable-final /s/ lenition in the dialects the children were exposed to.

There is one study that examines the comprehension of plural morphology in Spanish-speaking children from the Dominican Republic, where syllable-final /s/ is often omitted (Terrell 1981, Morgan 1998, Bradley 2006). Pérez-Leroux (2005) used a Picture Matching Task to test 23 3;0-6;0 year old Dominican Spanish-speaking children on their comprehension of verbal and nominal morphology. Children were shown sets of pictures (as in Figure 9) and read sentences like (12) and (13). Children heard sentences read in the natural Dominican Speech, which included aspiration of the plural morpheme (this was confirmed through personal correspondence with the author), and were asked to choose the corresponding picture.

Figure 9. Experimental Display in Pérez-Leroux (2005).
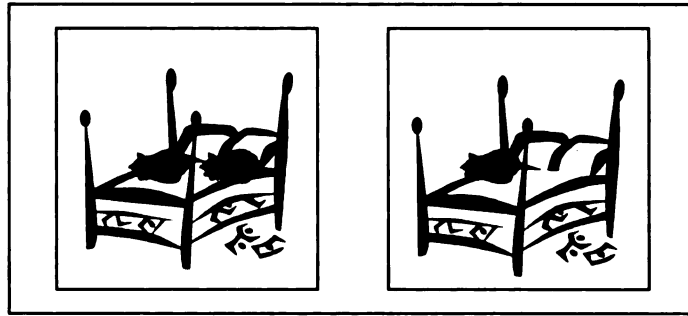


*Adapted from Pérez-Leroux (2005).

(12)  El    gato  duerme    en la  cama.

The.SG cat.SG sleeps.3.SG on the bed

'The cat is sleeping on the bed.'

(13)  Los   gatos  duermen  en la cama.

The.PL cats.PL sleep.3.PL on the bed

'The cats are sleeping on the bed.'

Importantly for the purposes of this dissertation, the findings of Pérez-Leroux showed that Dominican Spanish-speaking children between the ages of 3;2-4;5 only assigned a plural interpretation to plural definites 45% of the time and that they assigned an incorrect plural interpretation to the singular definites 48% of the time. The older children between 4;8-6;6 years of age assigned a plural reading to the definite plural 79% of the time but they also incorrectly assigned a plural reading to the singular definite 33% of the time. These findings are interesting if we compare them to those presented for English-speaking children who receive an input with systematic plural marking in Munn et al.

2006. As noted above, Munn et al. found that English-speaking children associated plural definites to an interpretation of 'more than one' 81% of the time and only incorrectly associated it to a interpretation of 'one' 17% of the time. While the English-speaking children clearly outperformed the younger Dominican Spanish-speaking child group, they perform only slightly better than the older Dominican Spanish-speaking child group, even though the older Dominican children were slightly older than the English-speaking children.

The differences in results between the Spanish-speaking and English-speaking children is even more interesting when we take into consideration the fact that the tasks differed for the Dominican Spanish-speaking children and the English-speaking children in that the English-speaking children only had the plural morpheme to rely on for their interpretation (e.g. the cow vs. the cow<u>s</u>) while the Dominican Spanish-speaking children had the plural morpheme, the form of the definite determiner, which was different in the plural vs. singular condition (e.g. l<u>os</u> gatos 'the.PL cats.PL' vs. <u>el</u> gato 'the.SG cat.SG') and subject-verb agreement. For this reason, it is quite astonishing that Dominican Spanish-speaking children performed so poorly and it suggests that the variability of plural morphology production by adult speakers may have an effect on Dominican children's comprehension of the plural morpheme. Note, however, that this comparison must be interpreted with caution as the experimental tasks were different and the social class and educational experiences of the children were not controlled for across the two languages.

Turning to varieties of American English, it has been reported that the plural morpheme is sometimes omitted on plural nouns in African American Vernacular English (AAVE) adult speech (Wolfram 1969, Fasold and Wolfram 1970, Moore 1979).

In an acquisition study, Ramer and Rees (1973) compared the production of plural morphology by AAVE-speaking children vs. Mainstream English-speaking children (MAE) and found that AAVE-speaking children and MAE-speaking children differed in their production of plural morphology after quantifiers, with AAVE-speaking children showing variable behavior. While this study shows differences in production, it does not show whether the variable input that AAVE-speaking children are exposed to affects comprehension of plural morphology.

Importantly, we want to know whether variable input also affects *comprehension*. Moore (1979) examined the comprehension and production of plural morphology by AAVE-speaking children by testing 100 4;6 – 14;6-year-old children from inner city Detroit, Michigan who came from working-class backgrounds. Moore notes that Detroit speakers of AAVE omit the plural morpheme when the noun is preceded by plural quantifiers and that the frequency of plural morpheme omission varied across social classes with the working-class speakers showing the highest percentage of plural morpheme omission (see Wolfram 1969, Fasold and Wolfram, 1970). In a sentence repetition task involving novel words, Moore found that 4;6 – 7;4 year old AAVE speaking children omitted the plural morpheme between 50 – 55% of the time. In an Berko style elicitation task testing whether children produce plural nouns headed by quantifiers, Moore found that 4;6 – 7;4 year old AAVE-speaking children only produced plural nouns approximately 67% of the time for real words and 35% of the time for novel words (see also Ramer and Rees 1973 for similar results). On a comprehension picture-matching task, Moore found that 4;6 – 7;4 year old AAVE-speaking children only

comprehended the plural morpheme approximately 55% of the time. That percentage

jumped to 80% by about 8;0 years of age.

Another feature of AAVE that appears to have a variable behavior is the third

person singular morpheme –s on English verbs. It has been reported that the third person

singular morpheme is frequently omitted in the speech of AAVE-speaking adults, being

omitted as much as 85% (see Wolfram and Schilling-Estes 1998) while it is not omitted

in the speech of MAE-speaking adults. Likewise for child speakers, Washington and

Craig (1994) showed that the 3$^{rd}$ person singular morpheme was omitted approximately

70% of the time in the speech of 5;0 year old AAVE-speaking children.

Johnson (2005) examined comprehension of the 3$^{rd}$ person singular morpheme in

MAE-speaking children vs. AAVE-speaking children by testing whether they could

indirectly assign number to the subject based on the presence or absence of the 3$^{rd}$ person

singular morpheme on the verb. Thirty working class 4 – 6 year old AAVE-speaking

children from an urban area of Connecticut and sixty-two middle-class 3-6 year old

Mainstream English-speaking children from a small town in western Massachusetts

participated in the study. A Picture Matching Task was used. Children were shown two

pictures (Picture 1: one cat sleeping on a bed vs. Picture 2: two cats sleeping on the bed)

and were asked to show the researcher the picture where (1) *the cat sleeps on the bed* or

(2) *the cats sleep on the bed.* The target sentences mask the plural morpheme on the noun

because the following verb begins with an alveolar fricative (the *catsleep/catsleeps* on the

bed). For this reason, only the presence or absence of the third person singular /s/

provides number information with respect to the subject. The findings of these studies

showed that while 5-6 year old MAE-speaking children (but not 3-4 year old MAE-

speaking children) performed significantly different from chance in their interpretation of the third person singular morpheme, AAVE-speaking children of the same age did not. These findings from Moore (1979) and Johnson (2005) suggest that variable input seems to cause a delay in the development of this grammatical morphology in comprehension.

Kovac and Adamson (1981) examined finite 'be' usage in 3 – 7 year old MAE- and AAVE-speaking children from Washington, D.C. Finite 'be' is sometimes produced and sometimes omitted in AAVE: 'she's/is jumping' vs. 'she jumping' but not in the speech of MAE-speaking adults (always produced: 'she's/is jumping'). Children provided free speech samples through picture description and role-play activities and through researcher-child interviews. Their results showed differences in development of finite 'be' usage between AAVE- and MAE- speaking children. While 3 – 5 year old working-class AAVE-speaking children showed steady increases in finite 'be' omission, 3 – 5 year old working-class MAE-speaking children showed steady decreases in finite 'be' deletion with steady increases in contraction. Even more interesting, however, is that while omission of finite 'be' is syntactically and phonologically constrained in the speech of adult AAVE-speakers, AAVE-speaking children who omitted finite 'be' in their own speech, had not yet acquired all of the various grammatical constraints on finite 'be' omission, even at 7 years of age. In other words, AAVE-speaking children were variable in their omission of finite 'be' but that variability was not governed by the same constraints governing the adult variability. Specifically, seven year old working-class and middle-class AAVE-speaking children differed from adults in that children omitted finite 'be' more often before predicative adjectives, as in (14), than when it occurred as an auxiliary, as in (15) and (16).

(14)  a.  She's/ is pretty.

      b.  She pretty.


(15)  a.  She's/ is eating.

      b.  She eating.


(16)  a.  She's/ is gonna eat.

      b.  She gonna eat.


Kovac and Adamson conclude that "children who have a non-standard model and who may be expected to have variable features in their adult speech may have the feature by age 5, even though the various constraints on the behavior of that feature may not be in order until considerably later" (p. 409).

Finally, Gathercole (1986) examined the production of the present perfect in the free speech of 4 – 6 year old Scottish English-speaking and American English-speaking children and adults. While Scottish and American adults both produce present perfect constructions, the degree to which they use the present perfect varies. Their results showed that although the distribution of the present perfect was similar between the two adult groups (used in a variety of semantic contexts), Scottish adults used the present perfect approximately 5 times as much as American adults, with American adults often preferring the simple past tense in the same contexts in which Scottish adults prefer the present perfect. Differences were also found between children. While Scottish children

produced the present perfect (excluding 'have got') 75 times in 6 hours of recorded speech, American children (one child) only produced the present perfect once. In other words, American English-speaking children almost never produced the present perfect construction. Gathercole concluded that frequency is a major contributor to the differences in present perfect production found between Scottish and American children. However, she does not address directly the issue of variability in the input presented to American children, an input where the present perfect and simple past are used in the same contexts to varying degrees. Although American adults produce both forms, American children appear to have not yet constructed a grammar with the present perfect construction. Further evidence for this is provided by the fact that in Gathercole's study American children often "incorrectly" used the simple past where the present perfect would have been more appropriate in the adult grammar (Adult: *"How long have you been dancing?"* Child: *"For 50 years I did it. "*, Adult: *"You've been dancing for 12 years?"* Child: *"I really danced for 300 years. "*) and American children often treat 'got' of the construction 'have got' as a verb by placing verbal morphology on it (Child: *"She gots a new baby"* for *She has got a new baby*). It appears that the variability in the input to American children (between the use of the present perfect and simple past forms in the same contexts) causes American children to initially rely on one form, the simple past (which is the more frequent form). I believe that the American English-speaking children avoided the present perfect in their own speech, not only because the simple past is more frequent than the present perfect in the input, but more importantly because both constructions overlap in the contexts in which they are uttered in the adult speech. While this study does not examine the acquisition of a form that is omitted, rather the

100

acquisition of two structures that may be in competition, it does show that American

English-speaking children did not pattern with American English-speaking adults, rather

the children consistently chose the simple past even when it was ungrammatical. This is

interesting because it suggests that the American English-speaking children were

acquiring a grammar that was different from the adults.

Most of the studies reported above on the acquisition of variable input suggest

that children exposed to variable input are variable in their own production although they

may not necessarily have acquired all of the constraints that govern that variability.

However, note that Gathercole's (1986) study suggests that children regularize variable

input, initially only acquiring one of two forms that are in competition. In addition, these

studies suggest that variable input involving omission of a particular form, appears to

result in a delay in comprehension of the form. In general, these findings on the

acquisition of variable input are consistent with the Variability Delay Hypothesis, which

was presented in Chapter 1.

In addition to the research discussed above, there have been other investigations

on the acquisition of variable input, where the variable input does not affect grammatical

features in the language. Smith et al. (2006) examines the acquisition of phonological and

morphological variation in Scottish children living in Buckie, Scotland. Eleven children

(2;10-3;6) and their parents were recorded and the data was examined for the

phonological variation between the use of the standard diphthong /√˙˙/ vs. the local (non-

standard) monophthong /u:/ and also for morphological variation with respect to the non-

standard local use of the 3rd person singular verb morpheme with third person plural

subjects ('My <u>trousers is</u> falling down' (non-standard) vs. 'My <u>trousers are</u> falling down' (standard)).

The findings of this study revealed different degrees of variation in adult speech depending on whether the adult was speaking with other adults vs. when they were speaking with their own children. In addition, Smith et al. found that patterns in child acquisition of phonological variation differed from patterns in child acquisition of morphological variation. For acquisition of phonological variation, their findings showed that while adult-to-adult speech revealed near categorical use of the local nonstandard form, the adult-to-child speech only contained 43% use of the local nonstandard form and children's speech matched closely to the adult speech (child speech contained 37% use of the local form). In other words, caregiver speech was variable between the local and standard forms and children were also producing both forms. However, for the morphological variation involving the 3$^{rd}$ person singular form of the verb, no such difference was found between adult-to-adult vs. adult-to-child speech. In fact, in this case, adults used more nonstandard forms with their own children than with other adults and, as with the phonological variation, children showed variable use of the third person singular morpheme as well. One important finding, with respect to the linguistic and extra-linguistics constraints that govern the variability of each variant, is that, while children seemed to understand the social implications of the phonological variants, they did not appear to understand the social constraints governing the morphological variants. On the other hand, they did seem to understand a number of grammatical constraints with respect to the production of the 3$^{rd}$ person singular morpheme.

Roberts (1994, 1997) examined (t/d) deletion and the production of (ing) ([iŋ] vs.

[ɪn]) in English-speaking children in order to determine whether children have mastered

both the linguistic and extra-linguistic constraints related to the deletion of these word-

final sounds. (-t/d) deletion comes about as a result of the reduction of consonant clusters

where words like 'cold' are produced as [kol], where [d] has been omitted. The

progressive marker –ing is also reduced in English adult speech to [ɪn], where words like

'kicking' are pronounced as [kɪkɪn]. Both phenomena are fairly widespread in English

adult speech and have a variable behavior, with reduction occurring more in certain

grammatical and phonological contexts and being more prevalent in adult working-class

speech and adult male speech. Roberts recorded 17 3 – 4 year old English-speaking

children from South Philadelphia working-class to lower middle-class children in order to

determine whether reduction in child language followed the linguistic (phonological,

grammatical) and extra-linguistic (social) constraints as those in the adult language.

Similar to Smith et al. (2006), Roberts found that children acquired the linguistic

constraints governing the variability before they acquired the extra-linguistic constraints.

Taken together, the results from Roberts and Smith et al. suggest that (1) children acquire

linguistic constraints for variable rules before extra-linguistic constraints, (2) that

phonological variable rules may be acquired before morpho-syntactic variable rules and

(3) adult speech varies in the use of certain variable forms depending on whether they are

talking to adults or to their own children.

We will next discuss the acquisition of inconsistent input by children. Inconsistent

input is different from variable input in that variable input is constrained by linguistic and

extra-linguistic factors, and therefore is predictable, while inconsistent input is not

constrained linguistically nor extra-linguistically and is, therefore, not predictable. Inconsistent input is found in the speech of non-native speakers of a language to their children. Singleton and Newport (2004) hypothesized that children exposed to inconsistent input would, nevertheless, be consistent in their own production. The basis of this hypothesis arises from research showing that children exposed to Creole languages spoken as a second language by parents who provide inconsistent input, nevertheless come to build a grammar that does not have any inconsistencies in grammatical marking. Singleton and Newport (2004) investigated how an ASL-signing child (Simon) acquired verbal morphology in ASL when the input of his parents was inconsistent with respect to these morphemes because they were late learners of ASL (they learned ASL in their teens). While they found that the non-native ASL-signing parents differed from native ASL-signing adults, their child Simon did not differ from native signers in his production of these morphemes, and in most cases Simon outperformed his parents, which indicates that Simon was regularizing the inconsistencies in the ASL he was acquiring.

Hudson Kam and Newport (2005) investigated language acquisition in the presence of consistent vs. inconsistent input by presenting English-speaking adults and children (Mean Age: 6;4) with an artificial language (matched to real world objects) that contained either consistent or inconsistent input with respect to the determiner system. The language contained 17 words: 4 verbs, 12 nouns and 1 determiner. Children were first explicitly taught all of the words of the artificial language, except for the determiners, through translation. In other words, the experimenter said, "if you want to say 'hit' in Sillyspeak (the artificial language), you say /flIm/". Next, children were presented with scenes followed by sentences in the artificial language describing the

scene. All subjects were exposed to the same basic input sentences. There were two experimental conditions and the input sentences differed across conditions only in the use of determiners. In the consistent condition, subjects heard the determiner produced with nouns 100% of the time, while, in the inconsistent condition, the determiner was present with nouns only 60% of the time. In the inconsistent condition there were no constraints governing the presence or absence of the determiner so there were no patterns for children or adults to learn.

After being taught the vocabulary of the artificial language, subjects were played the artificial language in 7 sessions over the period of 9 days and then tested on their acquisition of the determiner system through an elicitation task and a grammaticality judgment task. I will only discuss the elicitation task here. The elicitation task consisted in a translation task in which subjects were asked to translate sentences in English into the artificial language. For example, child and adult subjects were told, "I want you to tell me how to say 'the bear moves' in Sillyspeak" (p. 177). Based on the results of the elicitation task, subjects were grouped into three categories: Systematic Users, Systematic Nonusers, and Variable Users.[13] Systematic Users refers to child and adult subjects who systematically produced determiners in the elicitation task. Systematic Nonusers were subjects who systematically omitted the determiner and Variable Users were subjects who sometimes used and sometimes omitted the determiner in the elicitation task. The results of the elicitation task are shown in Table 12.

---

[13] There was one additional category, "Systematic Other", but only one child fell into this group and so it will not be discussed here.

Table 12. Percentage of Systematic Responses in Hudson Kam and Newport (2005).

| Input Type | Systematic User | Systematic Nonuser | Variable User |
|---|---|---|---|
| **Children** | | | |
| **100%** | 50% | 25% | 12.5% |
| | (4/8) | (2/8) | (1/8) |
| **60%** | 14.3% | 57% | 28.6% |
| | (1/7) | (4/7) | (2/7) |
| **Adults** | | | |
| **100%** | 100% | 0 | 0 |
| | (4/4) | | |
| **60%** | 0 | 50% | 50% |
| | | (2/4) | (2/4) |

*Adapted from Hudson Kam and Newport (2005).

The results of their study showed that of the 8 children exposed to consistent input (determiner produced 100% of the time), 4 of them systematically produced determiners in the elicitation task, 2 of them systematically omitted the determiner and 1 was variable in his own production of determiners (sometimes omitting and sometimes producing the determiner). Of the 7 children exposed to inconsistent input (determiner produced 60% of the time), 1 of them systematically produced the determiner in their own speech, 4 systematically omitted it, and 2 were variable in their production of the determiner.

The results suggest that children exposed to inconsistent input are generally systematic in their own production. In other words, the production of the children did not

match the input to which they were exposed. However, note that there were 2 children who were variable users. In other words, the production of these two children did match the input to some extent. If we are to generalize these results to the larger population, the results would suggest that, in general, inconsistent input results in systematic production, as approximately 70% (5 of 7 children) of the children were systematic in their production. This finding is consistent with Singleton and Newport (2004). While this generalization would not contradict previous findings that children exposed to variable input are variable, given that variable input is different from inconsistent input, we must still be cautious in making this generalization for a number of reasons.

First of all, both the language and the setting in which the language was learned and used was artificial. Secondly, it is not clear what we can make of the results for the children exposed to inconsistent input when we take into consideration the results for the children exposed to consistent input, where the determiner was always present in the input. In such a context, we would expect that 100% of children would be systematic users. However, the results show that only 50% (4 of 8 children) of them were systematic users, while 25% (2 of 8 children) of them always omitted the determiner and 12.5% (1 of 8 children) were variable users. There are at least two possible reasons why children exposed to an input with 100% determiner usage would not produce the determiner 100% of the time in their own production, either (1) they had difficulties with the experimental task or (2) there are differences in language learning strategies between children, if we assume that the task models natural language learning. In any case, once we take into consideration the finding that even children exposed to consistent input (100%) are unable to acquire the determiner in their own production, the response patterns of

children exposed to inconsistent input becomes less clear. Are systematic non-users in the inconsistent condition non-users because (1) of the input they were exposed to, (2) because they had difficulty with the task, or (3) because of differences in learning strategies compared to the other children in the inconsistent condition? Nevertheless, taken together with the findings from Singleton and Newport (2004), it appears to me that the results of Hudson Kam and Newport (2005) reveal that inconsistent input does result in systematic use or non-uses by children and it may just be the case that some children had difficulty with the experimental task. The Hudson Kam and Newport (2005) study is unique in that it provides a very nice way to manipulate the input (making it consistent or inconsistent) in order to see how children deal with such input. This is important for the present study as we first examine the type of input Chilean and Mexican children are exposed to and then determine how that input affects their comprehension of plural morphology.

3.3    Summary of Previous Research

*Acquisition of Plural Morphology:*

1.  When plural morphology is systematically produced in the input, Spanish-speaking and English-speaking children start producing the plural morpheme as early as 2;0 years of age.

2.  When plural morphology is systematically produced in the input, English-speaking children associate the plural morpheme to an interpretation of 'more than one' as early as 3;0 years of age in experimental studies investigating implicit knowledge of the plural morpheme and at least by 4;0 years of age in experimental studies investigating explicit knowledge of the plural morpheme.

3. Spanish-speaking and English-speaking children between 4;0-5;0 years of age do not use the Spanish allomorph [es] or the English allomorph [əs] productively (with novel words).

4. It appears that Spanish-speaking children initially place the plural morpheme on nouns and then extend marking to the determiner and adjectives; however, further research is needed here.

*Acquisition of Variable Input:*

1. It appears that Spanish-speaking children exposed to an input with syllable-final /s/ lenition may start producing the plural morpheme later than those exposed to varieties of Spanish with no syllable final /s/ lenition. However, the evidence is rather weak given that this late production was observed in only 3 children.

2. It appears that variable input that involves omission of a grammatical morpheme delays acquisition of that morpheme.

3. Children exposed to variable input appear to be variable in their own production although they may have not yet acquired all of the various linguistic and extra-linguistic constraints governing that variability by 6 years of age.

4. Children exposed to inconsistent input appear to pattern differently from children exposed to variable input. Inconsistent input appears to result in systematic use or non-use by children (and also possiblty in variable production by children), while variable input only seems to result in variable production by children.

CHAPTER 4

PRODUCTION OF PLURAL MORPHOLOGY

4.0     Introduction

The purpose of this chapter is to present production data that was collected from

Chilean and Mexican children and adults in order to compare the linguistic input to

Chilean vs. Mexican children and to determine how the linguistic input may be related to

how children perform on the comprehension tasks presented in Chapter 5. Chapter 4 has

three main goals. The first goal is to confirm previous findings on the variability of plural

morpheme production by Chilean Spanish-speaking adults reported in Cepeda (1995) and

presented in Chapter 2 of this dissertation and, furthermore, to confirm reports that

Mexican Spanish-speaking adults (of Mexico City) consistently produce the plural

morpheme. The second goal is to compare the production of the plural morpheme

between children vs. their parents. In other words, will Chilean and Mexican children

pattern with adults in their production of the plural morpheme or will there be

developmental differences between child vs. adult groups? Marrero and Aguirre (2003)

found that 3-year-old Spanish-speaking children omitted the plural morpheme on some

elements within the noun phrase. It may be the case that Mexican and Chilean children at

4 years of age still omit the plural morpheme some of the time and that patterns of

omission between the two child groups are similar to each other, yet different from the

adult groups. On the other hand, there may be no differences between 4-year-old children

and adults in their production of plural morphology; instead, we may find that by 4 years

of age child production of plural morphology is adult-like. The third goal is to compare

the production of plural morphology between Mexican children and adults vs. Chilean

children and adults. Here, there are at least two possible alternatives for the production of plural morphology in the child groups. The first alternative is that if 4-year-old children pattern with adults, then, while Mexican children would be systematic in their production of plural morphology, Chilean children would be variable and their variability would be similar to that found in the Chilean adult speakers. This is consistent with studies showing that children exposed to variable input are variable in their own production (Kovac and Adamson 1981, Labov 1989, Roberts 1994, 1997, Smith et al. 2006). However, if Chilean Spanish adult speakers sometimes omit and sometimes produce the plural morpheme, creating somewhat of an ambiguous input with respect to plural marking, it may be that Chilean children are unable to acquire such variability. Hence, a second alternative is that Chilean children, like Mexican children, would also be systematic in their production of plural morphology, either always omitting the plural morpheme or always producing it. This is consistent with the findings of Hudson Kam and Newport (2005) of children exposed to inconsistent input produced by adult non-native speakers to their children.

Based on previous research on the production of variable input, which was presented in Chapter 3, this dissertation predicts that while Mexican children will always produce the plural morpheme, Chilean children will be variable in their production of the plural morpheme, sometimes producing it and sometimes omitting it. In addition, Chilean children will differ from Chilean adults in the constraints governing their variable production. However, it is important to note that although Chilean children may produce the plural morpheme some of the time, it does not necessarily mean that they have associated the plural morpheme to an interpretation of 'more than one'. We know from

previous research that children produce certain grammatical morphemes before they are able to associate those morphemes to an interpretation (Johnson et al. 2005, Pérez-Leroux 2005). To ensure that production of the plural morpheme indicates that the child associates the plural morpheme to an interpretation of 'more than one', the child would have to provide plural-singular minimal pairs when naming plural vs. singular sets. Such a study will be presented in Chapter 5.

## 4.1    Method and Design

A Free Speech task, a Repetition Task and a Naming Task were used to collect production data from children and adults. The Free Speech Task consisted of collecting approximately 5-10 minutes of free speech data from child and adult subjects while they talked about topics of interest (e.g. children: cartoons, play-time activities; adults: family, work, and their children). In the Repetition Task subjects were presented with pictures and were asked to repeat sentences that the researcher read about each picture. Subjects only listened to the sentences. They did not see the written version. The research assistants produced the plural morpheme as [s] on all plural lexical items for both Mexican and Chilean subjects. All sentences involved plural or singular complex indefinite noun phrases and bare noun phrases, as in (1) and (2) below. The full set of sentences is shown in Appendix A.

(1)    Unos    bomberos están    comiendo manzanas.

Some.PL firemen.PL are.3.PL eating    apples.PL

'Some firemen are eating apples.'

(2)  Un        bombero  está   comiendo una       manzana.

A/One.SG fireman.SG is.3.SG eating    an/one.SG apple.SG

'A/One fireman is eating an/one apple.'

The phonological environment of syllable final /s/ was controlled for in the Repetition

Task. Cepeda (1995) found that final /s/ lenition was affected by the initial sound of the

following word. Table 13 shows the distribution of syllable final /s/ lenition reported in

Cepeda (1995). For this reason, the phonological environment in the Repetition Task was

controlled for in such a way that only environments where syllable final /s/ omission and

production were frequent were included. In this way, we provided an environment where

Chilean subjects could omit the plural morpheme in order to see whether they would. In

the Repetition Task, the plural morpheme was always preceded by words whose initial

sounds were a bilabial fricative( [β], 4 tokens), a bilabial nasal ([m], 4 tokens), an

unstressed vowel ([e], 8 tokens), or a sentence final pause (6 tokens). These phonological

environments are shaded in Table 13.

Table 13. /s/ Lenition by Phonological Environment in Chilean Spanish.

| Plural Variant | __#C [-cont] | __#C [+cont] | __#C [+nas] | __#V (Unstressed) | __#V (Stressed) | __## (Pause) |
|---|---|---|---|---|---|---|
| [s] | 1% | 1% | 1% | 6% | 25% | 12% |
| [h] | 83% | 55% | 71% | 42% | 38% | 35% |
| Omission | 16% | 44% | 28% | 52% | 36% | 54% |
| Total | 3594 | 3552 | 1406 | 2716 | 1018 | 3831 |

*Adapted from Cepeda (1995).

The type of noun phrase in the Repetition Task was also controlled for. With respect to the determiner in the noun phrase, Cepeda (1995) found that the plural morpheme was omitted about 34% of the time on polysyllabic determiners but only 13% of the time on monosyllabic determiners. In addition Cepeda also found that the plural morpheme was omitted more often on plural nouns headed by a determiner than on bare plural nouns. In order to provide an environment where plural morpheme omission was possible on the determiner, the Repetition Task included only indefinite determiners (*unos* 'some.PL' and *algunos* 'some.PL'). The experimental sentences contained four tokens of the plural *unos* (2 masculine and 2 feminine) and four tokens of the plural *algunos* (2 masculine and 2 feminine). The singular forms of these indefinites (*un/una alguno/alguna*) were included as controls. In addition, five bare plural noun phrases were included to allow for comparison with nouns headed by determiners. The indefinite noun phrases always occurred in subject position where verbal agreement was also an indicator of nominal number while the bare plural noun phrases always occurred in object position because Spanish bare nouns are restricted to object position. For this reason, the plural morpheme on the bare plural nouns in the Repetition Task was the only indicator of number[14].

Finally, in the Naming Task subjects were shown sets of miniature toys and asked to name the toys. The goal was to elicit bare plurals. The experimental question was always *¿Qué son?* ("What are.PL they?"), which includes the copular verb *son* ('are.3.PL') that is grammatically plural in order to ensure that plural nouns would be

---

[14] The fact that the subject noun phrases agree with the verb in number while the object noun phrases do not may cause subjects to omit more often on the subject than on the object, because there is additional number information for the subject.

elicited from subjects. The miniature toys included: *vacas* [βakas] ('cows'), *perros* [peřos] ('dogs'), *muñecas* [muñekas] ('dolls'), *lápices* [lapises] ('pencils'), *copas* [kopas] ('cups'), *autos* [autos] ('cars'), *arañas* [arañas] ('spiders'), *barcos* [βarkos] ('ships'), *peces* [peses] ('fish'), *bolitas* [βolitas] ('marbles') and *monos* [monos] ('monkeys'). Given that Chilean subjects always produced bare nouns in this task, the initial sound of the noun would have no effect on the omission of the plural morpheme.

## 4.2 Subjects

16 (4;5-5;11: Mean 5;2) ChWC children, 8 (4;8-5;11: Mean 5;3) ChMC children, 3 ChWC mothers, 4 ChMC mothers, 8 (4;8-5;9: Mean 5;4) MexWC children, 2 MexWC parents and 2 MexMC adults (MexMC adults were parents but not parents of the Mexican children who participated in the study) participated in the study. There are more ChWC children than ChMC children or MexWC children because not all ChWC children were asked to participate in the Free Speech task.

## 4.3 Procedure

Subjects were tested in the school or in their own homes by a native Spanish-speaking research assistant who was from the same local area as the subjects. During the Free Speech task, the native-speaking research assistant used colloquial forms of the plural morpheme in their own speech. In other words, the Chilean research assistants used mainly [s], [h] and ∅ while the Mexican research assistants used [s] and [z]. However, during the Repetition Task, both the Chilean and Mexican research assistants consistently pronounced the plural morpheme as an alveolar fricative. Given that in Chilean Spanish [h] and [zero] are the results of syllable final /s/ lenition, having the Chilean researchers pronounce the plural as [s] is providing subjects with the underlying

form. The Free Speech Task was administered first, followed by the Naming Task and then the Repetition Task. The Repetition Task was carried out last so as not to prime the use of the plural or any of its variant forms in subsequent tasks.

All data was recorded by a Sony Minidisc Digital Recorder (MZ-R70) with a standard Sony clip-on microphone or a Marantz PMD 222 recorder with a Shure miniature clip-on cardioid condenser microphone. Data was transcribed by research assistants who were native-speakers of Chilean or Mexican Spanish. After transcriptions were finished, all plural lexical items (e.g. nouns, determiners, adjectives) were coded for the pronunciation of the plural morpheme as [s], [h] or [zero]. All Chilean data was coded for pronunciation of the plural morpheme by two different Chilean Spanish-speaking research assistants. Issues related to reliability in coding between research assistants is discussed in Section 4.5. The Mexican data showed no variation in the pronunciation of the plural morpheme; it was pronounced as an alveolar fricative by both children and adults. For this reason, only one Mexican research assistant coded the Mexican data.

4.4    Analysis

The following analyses were carried out. First, the Mexican and Chilean data were compared to each other. Second, because the Chilean data showed variable behavior in the production of the plural morpheme, a variable rule analysis was carried out using GoldVarb 2.0 (Rand and Sankoff 2001). GoldVarb 2.0 is a multivariate analysis program which uses a binary logistic regression as a statistical model for variation analysis. An analysis by logistic regression is a way of using quantitative data to make predictions about possible relationships among different independent variables or factor groups (linguistic and extra-linguistic) that the researcher is investigating. Goldvarb 2.0 uses a

stepwise regression which considers incrementally complex models by adding factor groups and comparing the new model to previous ones until it finds the model that best describes the data (Paolillo 2002). Because the Mexican data showed no variability in plural morpheme pronunciation, no further analyses of the distribution of Mexican pronunciation of the plural morpheme could be carried out. The distribution for Mexican adult and child subjects was categorical.

The dependent variable was the omission of the plural morpheme. If Chilean subjects produced [s] or [h], they were scored as producing the plural morpheme. If subjects did not produce [s] or [h], they were scored as omitting the plural morpheme. Our coders noted that adult speakers sometimes produced an unreleased glottal stop as the plural morpheme but it was very difficult to distinguish these unreleased glottal stops from [h]. For that reason, any coding of the plural morpheme as an unreleased glottal stop was counted as [h] in the analysis. Cepeda (1995), the only study that I am aware of on Chilean syllable final /s/ lenition, did not document the use of the unreleased glottal stop. In future studies, a more detailed investigation will be needed to determine the frequency in which unreleased glottal stops are used by Chilean speakers.

Plural morphemes followed by words beginning with [s], [h] and/or [x] were not included in the data analysis since the presence of a following [s], [h] or [x] makes it impossible to determine whether or not the Chilean plural variant [s] or [h] was produced, as shown in (3) below.

(3)  a.  todos juntos

all.PL together.PL

[todos_xuntos], [todoh_xuntos], [todo_xuntos]


b.  los    sábados

the.PL Saturdays.PL

[los_saβaðos], [loh_saβaðos], [lo_saβaðos]


In cases as noted above, the plural token *todos* in (3a) and the plural token *los* in (3b) would not be included in the analysis. Plural morphemes followed by words beginning with [s], [h] or [x] only accounted for 1% of the total Chilean production data.

The logistic regression contained six independent variables or factor groups and each factor group had up to five factors each. The six factor groups are shown in Table 14.

Table 14. Factor Groups in Analysis of Chilean Production Data.

| Independent Variables | Factors |
|---|---|
| Age of Speaker | Children |
| | Adults |
| Social Class | Working-class |
| | Middle-class |
| Style | Free Speech |
| | Repetition Task |
| | Naming Task |
| Independent Number Information | Yes: DP with numerals or quantifiers |
| | No: DP without numerals or quantifiers |
| Syntactic Category | Definites (*mis, nuestros, sus, los, ellas;* clitics: *les, los*) |
| | Indefinite Determiner (*unos*) |
| | Quantifiers (*algunos, muchos, pocos, todos, hartos, etc.*) |
| | Adjectives |
| | Nouns |
| Order | First |
| | Second |
| | Third or more |

The factor groups included in the analysis were Age, Social Class, Style, Independent

Number Information, Syntactic Category and Order. Age, Social Class and Style are

extra-linguistic factors and Syntactic Category, Number Information and Order are

linguistic factors. For the factor group 'Age of Speaker' the tokens were coded as being

produced either by adult speakers or child speakers.

For the factor group 'Social Class', the tokens were coded as being produced

either by working-class speakers or middle class speakers. Social class was determined

primarily by the profession of the children's parents and the tuition of the school children

attended. The occupations of the working-class Chilean and Mexican parents included

secretary, fisherman, butcher, low-ranking military, taxi driver, homemaker, janitor, and

inventory worker. The occupations of the middle-class Chilean and Mexican parents

included business men/women, high-ranking military officials, doctor, university

professors, and lawyer. While the working-class Mexican and Chilean children attended

free daycare/preschool and kindergartens, the middle-class Chilean children (middle-

class Mexican children were not tested) attended private schools which were considered

prestigious and had the highest tuition rates in the town in which they were located (in

Punta Arenas, Chile). Social class was included in the analysis because Cepeda (1995)

found that plural morpheme omission is more frequent in the speech of Chilean working-

class speakers than in Chilean middle-class and upper-class speakers. Working-class

Mexican children were only included in the study to ensure that any differences between

working-class and middle-class Chilean children were not due entirely to social class

(e.g. educational experiences) but rather to the differences in plural morpheme omission in the adult speech (i.e. the linguistic input to which children were exposed).

For the factor group 'Style' tokens were coded as being produced during the Free Speech Task, the Repetition Task, or the Naming Task. The Free Speech Task was the most informal production task and the Naming Task and Repetition Task were the most formal. It was predicted that we would find more omissions in the Free Speech Task and less omissions in the Naming Task and Repetition Task.

The factor group 'Independent Number Information' refers to whether or not the determiner phrase contained independent number information in the form of plural numerals or plural quantifiers (e.g. *muchos* ('many.PL'), *pocos* ('few.PL'), *todos* ('all.PL'), *hartos* ('several.PL'), *varios* ('various.PL'). This was included because it was observed in pilot data that Chilean subjects often omitted the plural morpheme on nouns when they were preceded by numerals and quantifiers, as in phrases like *Tiene 5 año∅* ('He is 5 years.PL old') or *todo∅ lo∅ año∅* ('all.PL the.PL years.PL').

For the factor group 'Syntactic Category' tokens were coded for the syntactic category to which the plural lexical item belonged. There were five syntactic categories, as shown in Table 14. The category 'Definite' included definite determiners, possessive determiners, demonstratives and clitic pronouns (*les, los, las*). The category indefinite determiner only included the indefinite forms *unos/unas* ('some.PL'). Indefinite determiners were coded separately from other determiners because of the similarity between the word for 'one' (*un/una*) and the plural indefinite (see comprehension experiments in Chapter 5). I was interested to see whether speakers would retain the plural morpheme more often on the indefinite determiner because without it, the plural

121

indefinite would be identical in form to the numeral 'one' in Spanish. Quantifiers like

*algunos* ('some.PL'), *muchos* ('many.PL'), *pocos* ('few.PL'), *hartos* ('many.PL'), and

*todos* ('all.PL') were coded as Quantifier. *Algunos* ('some.PL') was coded as a quantifier

in the factor group Syntactic Category because it is used more often in the plural form

than in the singular and hence its presence generally indicates quantity. In the singular it

appears to have very special restrictions. The syntactic category Noun included common

nouns only.

Finally, the factor group "Order" was included because Cepeda (1995) found that

plural elements which occur first in the determiner phrase are generally marked for plural

while plural elements which occur later in the determiner phrase are not. For this factor

group, each plural token was coded for its linear position within the determiner phrase

with respect to other plural tokens. The sentences in (4) and Table 15 provide an example

of how lexical items were ordered. The method for ordering the items in this way was

based on Cepeda (1995) in order to allow for comparison with previous research on

Chilean Spanish. The examples in (4) would be coded for order according to Table 15.


(4)     a.      unos    gatos

                some.PL cats.PL


        b.      los     gatos   y   los     perros

                the.PL cats.PL and the.PL dogs.PL

c.     cuatro gatos

       four    cats.PL


d.     tengo gatos

       I have cats.PL


e.     los    otros    gatos

       the.PL other.PL cats.PL


f.     los    otros    años    anteriores

       the.PL other.PL years.PL before.PL


Table 15. Ordering of Lexical Items within the DP.

|     | 1 | 2 | 3+ | 3+ |
| --- | --- | --- | --- | --- |
| a. | unos | gatos | | |
| b. | los | gatos | | |
|    | los | perros | | |
| c. | (cuatro) | gatos | | |
| d. | gatos | | | |
| e. | los | otros | gatos | |
| f. | los | otros | años | anteriores |

123

As shown in Table 15, ordering consisted of first position, second position and any position beyond second position (3+). Only plural tokens and numerals were counted in the ordering. Cepeda was interested in whether redundancy of plural marking caused subsequent elements within the noun phrase to occur without a plural morpheme.

While there is very little research about the amount of recorded speech needed to carry out an individual variable rule analysis on children using binary logistic regression, Roberts (1994) found that a total of 30 tokens per factor in each factor group was sufficient for such an analysis (in line with Guy 1980). Since the factor groups in the present analysis have up to five factors each, my goal was to collect approximately 150 tokens of plural morpheme production for each subject group: ChWC children, ChMC children, ChWC adults and ChMC adults. While an optimal goal would have been to collect 150 tokens *per subject* (instead of per subject group) in order to carry out an *individual* variable rule analysis of each subject, this would have required approximately 1.5 hours of free speech per child (we found that children produced approximately 35 plural tokens in a 15-minute period). Such an extensive study of production is beyond the scope of this dissertation given the numerous comprehension tasks that were also being carried out. In any case, I believe that the production data presented in this chapter, along with previous research on Mexican and Chilean Spanish, will nonetheless provide an informative overview of the input to which Mexican and Chilean children are exposed and the production of plural morphology in Mexican and Chilean children.

## 4.5    Results

A total of 1739 plural tokens were collected from Chilean subjects. Of these 1739 tokens, 646 were from ChMC adults, 336 from ChMC children, 258 from ChWC adults

and 499 from ChWC children. A total of 1308 plural tokens were collected from Mexican subjects. Of these 1308 plural tokens, 433 were from MexWC adults, 340 from MexMC adults, and 535 from MexWC children.

It is first important to note that with respect to the Chilean data, inter-rater reliability between the two Chilean native speaking coders reached approximately 83.5% of all plural tokens. In other words, the coders disagreed on 285 of the 1739 tokens (16.4%) and disagreement was between [h] vs. Ø or the unreleased glottal stop vs. Ø, where one native speaker coded as Ø and the other has [h] or the glottal stop. In such cases of disagreement between coders (approximately 16.4% of the tokens), the token was coded as Ø under the reasoning that if native speaking coders could not decide between zero vs. plural ([h] or the unreleased glottal stop), native speaking children would also have difficulty distinguishing between presence vs. absence of the plural morpheme.

The logistic regression revealed that only five of the six factor groups contributed significantly to the model describing the distribution of plural morpheme omission. These factor groups are: 'Age of Speaker', 'Social Class', 'Style', 'Independent Number Information' and 'Syntactic Category'. The factor group 'Order' did not influence the omission of the plural morpheme in the model generated by the logistic regression. Table 16 shows the five factor groups followed by the factor weights. The factor weights are reported as probabilities between zero and one. The further the factor weight is from 0.5, the greater its effect on the resulting probability. A factor weight above 0.5 can be considered as favoring the omission of the plural morpheme and a factor weight below 0.5 as disfavoring omission of the plural morpheme (Paolillo 2002, Smith et al. 2006).

Table 16. Factor Groups and Factor Weights for Chilean Production Data.

| Factor Groups | Factor Groups | | | | |
|---|---|---|---|---|---|
| **Age of Speaker** | Adult | Child | | | |
| | .468 | .535 | | | |
| **Social Class** | MC | WC | | | |
| | .359 | .679 | | | |
| **Style** | F. Speech | Repetition | Naming | | |
| | .609 | .407 | .349 | | |
| **Independent Number Information** | Yes | No | | | |
| | .579 | .484 | | | |
| **Syntactic Category** | Adj. | Noun | Quantifier | Indefinite | Determiner |
| | .71 | .563 | .478 | .428 | .257 |

**Log likelihood = -1038.802**

The results of the logistic regression showed that the 5 factors presented in Table 16 had a significant effect on the omission of the plural morpheme (p<.05). The overall probability that the plural morpheme would be omitted, given the model presented in Table 16, is .63. Table 16 basically confirms what was reported in Cepeda (1995) with respect to Chilean adult Spanish-speakers. First of all, the factor 'Working-class' (.678)

126

favors plural morpheme omission while the factor 'Middle-class' (.360) disfavors plural

morpheme omission. Moreover, like Cepeda, we find that the factor 'Determiner'

(definite, possessive and clitics) (.251) disfavors omission while the factors 'Adjective'

(.702) and 'Noun' (.563) favor omission of the plural morpheme. The data in Table 16

also reveal that Style affects the omission of the plural morpheme, with the Free Speech

Task (.609) favoring omission and the Repetition Task (.407) and the Naming Task

(.349) disfavoring omission. With respect to independent number information (i.e. the

plural morpheme occurring in noun phrases with quantifiers or numerals), the data show

that the presence of a quantifier or numeral favors omission slightly more than the

absence of quantifiers and numerals. With respect to the age of the subject, the data

reveal that Chilean children are slightly more likely to omit the plural morpheme than

Chilean adult speakers.

Of the 1739 plural tokens collected from Chilean subjects, 671 (38.5%) were $\varnothing$[15]

and 1068 (61.4%) were marked for plural ([h] or [s]). Of the 1308 plural tokens collected

from Mexican subjects, 11 (0.8%) were $\varnothing$ and 1297 (99.1%) were marked for plural.

Table 17 shows the amount of plural morpheme production and omission broken down

per child and adult groups. The amount of data collected from each subject was not

uniform for a variety of reasons, including the fact that some children were shy and more

reluctant to talk than others or because of interference in recording (e.g. child fidgeting

during the recording session, etc.).

---

[15] The reader is reminded here that disagreement between coders on [h] vs. $\varnothing$ or the unreleased glottal stop and $\varnothing$ was counted in the analysis as $\varnothing$.

Table 17. Percentage of Plural Responses for Production Data.

| Subject SES | Subject Age | Morpheme ([s] or [h]) | Omission (∅) | Total Plural Tokens |
|---|---|---|---|---|
| ChMC | Adults | 67% (433) | 33% (213) | 100% (646) |
| | Children | 83% (278) | 17% (58) | 100% (336) |
| ChWC | Adults | 56% (145) | 44% (113) | 100% (258) |
| | Children | 42% (212) | 58% (287) | 100% (499) |
| MexMC | Adults | 99% (335) | 1% (5) | 100% (340) |
| MexWC | Adults | 99% (430) | 1% (3) | 100% (433) |
| | Children | 99% (532) | 1% (3) | 100% (535) |

Table 17 shows that the production of plural morphology differs between Mexican and Chilean subjects. While Mexican adult and child subjects produced the plural morpheme on almost 100% of all plural lexical items, Chilean adult and child subjects omitted the plural morpheme on 17% to 58% of all plural lexical items. Hence, the data confirm that the linguistic input to Chilean vs. Mexican children differs with respect to the plural morpheme. Given the difference in linguistic input, the data further reveal that Chilean children and Mexican children do not pattern alike in their production of plural morphology. Rather Chilean children, like Chilean adults, appear to show variability in their production of plural morphology and Mexican children, like Mexican adults, appear to consistently mark plural lexical items with a plural morpheme. This suggests that

128

children exposed to variable input will be variable in their own production. Furthermore, it suggests that when plural morphology is systematically produced in the input, children, in this case Mexican children, will have acquired that adult-like systematicity in their own production by approximately 4 years of age.

Secondly, Table 17 shows that differences in plural morpheme production based on SES only occur in Chilean speakers but not Mexican speakers. The data show that while there are no differences in plural morpheme production between MexWC adults and MexMC adults and that MexWC children are at ceiling in their production of the plural morpheme (suggesting very strongly that MexMC children would also perform at ceiling and hence, pattern with MexWC children), there are several differences between the Chilean working-class and Chilean middle-class groups. First of all, ChWC adults omit the plural morpheme at a higher rate than ChMC adults, which is consistent with Cepeda (1995). Likewise, the data indicate that ChWC children omit the plural morpheme at a higher rate than ChMC children. Hence, the data show an overall trend of Mexican subjects producing plural morphology all of the time followed by ChMC subjects producing plural morphology less than Mexican subjects but more than ChWC subjects. ChWC subjects omit the plural morpheme more than any of the other dialect groups. This is consistent with previous research indicating that Mexican Spanish always marks the plural and with research indicating that ChWC subjects omit the plural morpheme more often than ChMC subjects (Cepeda 1995, Lipski 1994, Canfield 1982).

One unexpected finding was that while ChWC children omitted the plural morpheme more often than ChWC adults, ChMC children *produced* the plural morpheme more often than ChMC adults. ChMC adults omitted the plural morpheme on

approximately 33% of all plural tokens while ChMC children only omitted the plural morpheme on 17% of all tokens. This suggests that ChMC adults may omit the plural morpheme less frequently when addressing their children than when addressing other adults. This is consistent with Smith et al. (2006) who found that adult speakers differ in their use of variable features depending on whether they are addressing their own children or other adults. Production data of adult ChMC speakers talking with their own children will be needed in future studies to determine whether adults indeed omit less when addressing their own children; however, the data here suggests that this may be the case. Alternatively, it is possible that ChMC children are regularizing the variable input to some extent, using the plural morpheme less variably than adults. If children have not acquired all of the constraints governing the variable behavior of plural morpheme omission, the data may be inconsistent for them. Hence, we might expect them to regularize to some extent. This is consistent with Hudson Kam and Newport 2005. Future research will need to address this question.

The data show that Chilean subjects are variable in their production of plural morphology, sometimes omitting the morpheme and sometimes producing it, while Mexican subjects are not. Looking more closely at the variants of the plural morpheme produced by subjects we find that, while Chilean adults and children produced both [s] and [h] as the plural morpheme to varying degrees, Mexican adults and children almost always produced the plural morpheme as an alveolar fricative. Table 18 shows the percentage of the variants [s] and [h] of the plural morpheme and also of the omission of the plural morpheme.

Table 18. Percentage of Plural Variants in Production Data.

| Subject SES | Subject Age | [s] | [h] | Ø |
|---|---|---|---|---|
| ChMC | Adults | 15% (95) | 52% (338) | 33% (213) |
| | Children | 44% (149) | 38% (129) | 17% (58) |
| ChWC | Adults | 13% (34) | 43% (110) | 44% (113) |
| | Children | 22% (108) | 21% (104) | 58% (287) |
| MexMC | Adults | 98% (332) | 0.9% (3) | 1.5% (5) |
| MexWC | Adults | 98% (425) | 1% (5) | 0.7% (3) |
| | Children | 99% (531) | 0.2% (1) | 0.5% (3) |

In Table 18 we see that ChWC and ChMC adult groups seemed to pattern together by using [h] as the plural morpheme more often than [s]. Unlike the Chilean adult groups, ChWC and ChMC children produced the plural variant [s] just as often as [h]. In fact, both ChWC and ChMC children produced the plural as [s] more often than Chilean adults. This suggests that Chilean children are exposed to both the [s] and [h] variants of the plural morpheme in the input they are exposed to and that Chilean adult speakers may be using the [s] variant more often with their children than with other adult speakers. However, we must be cautious in assuming that this finding suggests that Chilean adults may use [s] more often with their children given that we have not yet broken the data down by task type. For example, there are more Chilean children than Chilean adults who

participated in the Naming Task and Repetition Task, which might elicit more [s] variants than the Free Speech Task. The next section (Section 4.5.1) will look at this in more detail.

A very important question at this point is whether there were Chilean children who were systematic in their production or omission of the plural morpheme, in other words, whether there were individual children who always omitted or always produced the plural morpheme. While we found that all Mexican children were systematic in their production of plural morphology, always producing it, the above data does not clarify this for the Chilean children. A closer look at the data show that for the most part Chilean children were not systematic, but rather they were variable, in their production of the plural morpheme. The number of plural tokens produced with and without the plural morpheme for each child and adult subject is shown in Table 19.

Table 19. Number of Plural Tokens by Subject.

**ChWC Children**

| Subject | Ø | [s]/[h] |
|---|---|---|
| 1 | 3 | 4 |
| 2 | 12 | 22 |
| 3 | 7 | 0 |
| 4 | 17 | 14 |
| 5 | 27 | 9 |
| 6 | 29 | 11 |
| 7 | 34 | 7 |
| 8 | 22 | 14 |
| 9 | 8 | 34 |
| 10 | 10 | 7 |
| 11 | 8 | 0 |
| 12 | 18 | 13 |
| 13 | 27 | 23 |
| 14 | 22 | 8 |
| 15 | 17 | 29 |
| 16 | 18 | 3 |

**ChMC Children**

| Subject | Ø | [s]/[h] |
|---|---|---|
| 1 | 9 | 24 |
| 2 | 6 | 24 |
| 3 | 19 | 50 |
| 4 | 4 | 39 |
| 5 | 3 | 30 |
| 6 | 7 | 39 |
| 7 | 7 | 31 |

**ChWC Adults**

| Subject | Ø | [s]/[h] |
|---|---|---|
| 1 | 23 | 19 |
| 2 | 38 | 76 |
| 3 | 50 | 49 |

**ChMC Adults**

| Subject | Ø | [s]/[h] |
|---|---|---|
| 1 | 52 | 125 |
| 2 | 60 | 121 |
| 3 | 34 | 72 |
| 4 | 67 | 115 |

Table 19. Number of Plural Tokens by Subject cont'd.

**MexWC Children**

| Subject | Ø | [s]/[h] |
|---------|---|---------|
| 1 | 0 | 92 |
| 2 | 0 | 19 |
| 3 | 1 | 76 |
| 4 | 0 | 60 |
| 5 | 1 | 43 |
| 6 | 0 | 17 |

**MexMC Adults**

| Subject | Ø | [s]/[h] |
|---------|---|---------|
| 1 | 2 | 248 |
| 2 | 3 | 87 |

**MexWC Adults**

| Subject | Ø | [s]/[h] |
|---------|---|---------|
| 1 | 3 | 154 |
| 2 | 0 | 276 |

There were only 2 ChWC children who never produced a plural token with a plural morpheme (ChWC 3 and ChWC11); however, these are only two children and also each child produced few tokens. For that reason, we must be cautious in generalizing this particular finding to the larger population. The data in Table 19 show that each individual Chilean subject is variable in their production of the plural morpheme, while the Mexican subjects are systematic.

4.5.1    The Effect of Style on Plural Morpheme Production

Research has shown that different types of speech tasks (free speech task vs. picture description task) affect the variable forms used by 4 – 6 year old children (Washington et al. 1998). Furthermore, research has indicated that by four years of age children have acquired some but not all of the constraints governing the variable rules

134

and that extra-linguistic constraints appear to be acquired later than linguistic constraints (Roberts 1994, 1997, Smith et al. 2006). The production data collected for this dissertation was analyzed for Speech Style as it was predicted that in more careful speech, speakers would produce the plural morpheme more often. In other words, it was predicted that there would be more omissions in the Free Speech Task and less omissions in the Repetition and Naming Tasks, under the assumption that the Free Speech task would elicit more casual speech and the Repetition and Naming Tasks more careful speech. Table 20 shows the percentage of plural morpheme omissions according to speech task.

Table 20. The Effect of Style on Plural Morpheme Production.

|  | Free Speech | Repetition Task | Naming Task |
|---|---|---|---|
| **ChMC Adults** |  |  |  |
| [s] | 4% (19/505) | 46% (43/93) | 69% (33/48) |
| [h] | 57% (287/505) | 45% (42/93) | 19% (9/48) |
| ∅ | 39% (199/505) | 9% (8/93) | 12.5% (6/48) |
| **ChWC Adults** |  |  |  |
| [s] | 3% (6/194) | 24% (10/42) | 86% (19/22) |
| [h] | 46% (89/194) | 48% (20/42) | 4.5% (1/22) |
| ∅ | 50.5% (98/194) | 29% (12/42) | 9% (2/22) |
| **ChMC Children** |  |  |  |
| [s] | 32% (38/117) | 45% (80/179) | 85% (34/40) |
| [h] | 42% (49/117) | 43% (77/179) | 0% |
| ∅ | 26% (30/117) | 12% (22/179) | 15% (6/40) |
| **ChWC Children** |  |  |  |
| [s] | 16% (11/67) | 16.5% (43/261) | 31.5% (54/171) |
| [h] | 31% (21/67) | 21.5% (56/261) | 16% (27/171) |
| ∅ | 52% (35/67) | 62% (162/261) | 53% (90/171) |

Table 20 shows the percentage of plural tokens marked with the plural variants [s] or [h] and also the percentage of plural morpheme omission for Chilean Subjects. Table 20 does not display results for Mexican subjects because there was no variability. First, note that

136

there is less Free Speech Task data for children than for adults but more Repetition Task

and Naming Task data for children than for adults. This is due to the fact that less free

speech data was collected from Chilean children than from Chilean adults and some

children produced very few plural tokens in free speech. In any case, it is revealing to

observe that even in the Repetition Task[16] and the Naming Task, ChWC children omitted

the plural morpheme more often than any of the other three groups in any of the other

tasks, including the Free Speech Task. In fact, ChWC children omitted the plural

morpheme as much in the Repetition Task and the Naming Task as they do in the Free

Speech Task, which suggests that the small number of plural tokens collected for ChWC

children in the Free Speech Task does not directly affect the overall findings of the

production data presented here.

With respect to the variant forms of the plural morpheme, it is first important to

note that both the [s] and [h] variant forms and also omissions were found in the speech

of all Chilean groups: ChMC children, ChMC adults, ChWC children, ChWC adults. The

data show that frequency of the variant forms changed depending on the speech task.

Table 20 shows that in the Free Speech Task all Chilean subjects used [h] more

frequently than [s]; however, note that in the Free Speech Task both ChWC adults and

ChWC children omitted the plural morpheme more often than they used [h]. As the

experimental task increases in formality, the percentage of omissions decreases while the

percentage of the variant [s] increases for both ChWC adults and ChMC adults. The same

trend was found for ChMC children but not for ChWC children, who maintained

approximately the same percentage of omissions across speech tasks. However, ChWC

---

[16] Remember that the Chilean researcher was pronouncing the plural morpheme as [s] in
the Repetition Task.

children, like the other three Chilean groups, did drastically increase their usage of [s] in the Naming Task. A second Naming Task (Study 4) is presented in Chapter 5 where I will discuss in more detail the increase of the plural variant [s].

It is interesting to note at this point the fact that the [s] variant was more frequent in the Free Speech and Naming Task of ChMC children than in the speech of the ChMC adults. In the Repetition Task the frequency of [s] was similar between the two middle-class groups. This data further suggests that ChMC adults may be using more [s] when addressing their own children than when addressing other adult speakers. In a sense, ChMC children tend to overuse the [s] variant in Free Speech compared to adult speakers. On the same token, notice that ChWC children produce more omissions than the ChWC adults in the Repetition Task and the Naming Task, but not in the Free Speech Task, where the frequency of omissions is similar between ChWC adults and ChWC children. This suggests that ChWC adults may produce more omissions in their speech to their children yet they understand the social constraints governing plural morpheme omission resulting in a decrease of omissions in the more formal speech tasks.

## 4.5.2  The Effect of Syntactic Category on Plural Morpheme Production

Cepeda (1995) found that the plural morpheme was produced more often in certain syntactic categories than in others. For example, she found that the plural morpheme was produced more often on determiners than on nouns or adjectives. It is difficult to conclude from her data whether the plural morpheme was produced equally on quantifiers, indefinites and adjectives because Cepeda combined these together in her analysis. Table 21 shows the data collected in the present dissertation broken down by syntactic category.

Table 21. The Effect of Syntactic Category on Plural Morpheme Production.

| ChMC Adults | Indefinite | Definite | Quantifier | Noun | Adjective |
|---|---|---|---|---|---|
| Plural [s]/[h] | 81% | 86% | 71% | 61% | 39% |
| | (22/27) | (136/158) | (46/65) | (206/337) | (23/59) |
| [s] | 22% | 1% | 12% | 23% | 3% |
| | (6/27) | (2/158) | (8/65) | (77/337) | (2/59) |
| [h] | 59% | 85% | 58% | 38% | 36% |
| | (16/27) | (134/158) | (38/65) | (129/337) | (21/59) |
| ∅ | 19% | 14% | 29% | 39% | 61% |
| | (5/27) | (22/158) | (19/65) | (131/337) | (36/59) |

| ChWC Adults | Indefinite | Definite | Quantifier | Noun | Adjective |
|---|---|---|---|---|---|
| Plural [s]/[h] | 100% | 66% | 63% | 48% | 50% |
| | (12/12) | (40/61) | (15/24) | (73/151) | (5/10) |
| [s] | 17% | 3% | 8% | 19% | 10% |
| | (2/12) | (2/61) | (2/24) | (28/151) | (1/10) |
| [h] | 83% | 62% | 54% | 30% | 40% |
| | (10/12) | (38/61) | (13/24) | (45/151) | (4/10) |
| ∅ | 0% | 34% | 38% | 52% | 50% |
| | (0) | (21/61) | (9/24) | (78/151) | (5/10) |

| ChMC Children | Indefinite | Definite | Quantifier | Noun | Adjective |
|---|---|---|---|---|---|
| Plural [s]/[h] | 94% | 79% | 86% | 81% | 67% |
| | (30/32) | (22/28) | (51/59) | (173/214) | (2/3) |
| [s] | 19% | 11% | 17% | 60% | 67% |
| | (6/32) | (3/28) | (10/59) | (128/214) | (2/3) |
| [h] | 75% | 68% | 69.5% | 21% | 0% |
| | (24/32) | (19/28) | (41/59) | (45/214) | (0) |
| ∅ | 6% | 21% | 13.5% | 19% | 33% |
| | (2/32) | (6/28) | (8/59) | (41/214) | (1/3) |

| ChWC Children | Indefinite | Definite | Quantifier | Noun | Adjective |
|---|---|---|---|---|---|
| Plural [s]/[h] | 41% | 65% | 36% | 43% | 36% |
| | (18/44) | (15/23) | (24/67) | (151/354) | (4/11) |
| [s] | 9% | 4% | 6% | 28% | 9% |
| | (4/44) | (1/23) | (4/67) | (98/354) | (1/11) |
| [h] | 32% | 61% | 30% | 15% | 27% |
| | (14/44) | (14/23) | (20/67) | (53/354) | (3/11) |
| ∅ | 59% | 35% | 64% | 57% | 63% |
| | (26/44) | (8/23) | (43/67) | (203/354) | (7/11) |

The Chilean data show that both ChMC and ChWC adults produce the plural morpheme more often on determiners (including indefinites and quantifiers) and omit the plural morpheme more often on nouns and adjectives. Like ChWC adults, ChWC children appear to produce the plural morpheme more often on determiners than on nouns. However, ChMC children do not appear to be influenced by syntactic category in their production of the plural morpheme. While it may appear that syntactic category does affect their production (94% on Indefinites appears different from 67% on adjectives), we must take into consideration that there are only 3 tokens total for the syntactic category Adjectives, which is too small to draw any conclusions from.

However, the data do show that all Chilean subjects, including child subjects, appear to be constrained by syntactic category to some extent in their production of the two plural variants [s] and [h]. All four subjects groups produced the [h] variant more often on determiners and although the [s] variant was not very frequent in the data, Chilean adult subjects produced it more often on nouns and on indefinite determiners while Chilean child subjects produced it more frequently on nouns. This is especially true for ChMC children who produced the variant [s] 60% of the time on nouns but only 11% of the time on Determiners.

### 4.5.3   The Effect of Order on Plural Morpheme Production

In addition to syntactic category, Cepeda (1995) found that Chilean adult speakers produced the plural morpheme in different frequencies depending on the linear position of the plural token within the determiner phrase. Cepeda found that it was the first NP constituent that carried the functional load of the plural morpheme and that subsequent

elements within the determiner phrase often occurred without the plural morpheme. Cepeda's data is shown in Table 22.

Table 22. The Effect of Linear Order on Plural Morpheme Production.

| | Premodifier[17] | | Noun | | |
|---|---|---|---|---|---|
| | 1 | 2 | N1 | N2 | N3 |
| [s]/[h] | 79% | 71% | 55% | 42% | 39% |
| Ø | 21% | 24% | 45% | 58% | 61% |

*Adapted from Cepeda (1995).

Cepeda's results showed that the plural morpheme was omitted more often on nouns than on nominal premodifiers (i.e. determiners), regardless of the linear order. Note that in column N1, which indicates that the noun occurred bare, without a determiner, the plural morpheme is omitted approximately 45%. However, in the Premodifier columns the plural morpheme is only omitted approximately 21% of the time. Both the Premodifier 1 column and the N1 column are the first linear position in the DP. Cepeda's data suggest that the first linear position retains the plural morpheme more often than the second and third linear positions.

While the factor group 'Order' did not contribute significantly to the overall model of plural morpheme omission in the present dissertation, I will nevertheless discuss it in order to highlight any trends. Table 23 shows the percentage of plural morpheme production and omission on determiners and on nouns when the noun

---

[17] Cepeda (1995) used the term "Premodifier" to describe determiners, quantifiers, adjectives and numerals. Unfortunately, she did not break the data down by type.

141

occupies the first linear position (bare nouns) and the second linear position (nouns

headed by a determiner or numeral).

Table 23. The Effect of Order on Plural Morpheme Production.

| | | Determiner | Noun | |
| --- | --- | --- | --- | --- |
| | | D1 | N1 (Bare Nouns) | N2 (D/Q + N) |
| ChMC Adults | Plural [s]/[h] | 87% (122/141) | 75% (82/110) | 55% (109/198) |
| | Ø | 13% (19/141) | 25% (28/110) | 45% (89/198) |
| ChWC Adults | Plural [s]/[h] | 68% (37/57) | 68% (36/53) | 37% (32/86) |
| | Ø | 32% (20/57) | 32% (17/53) | 63% (54/86) |
| ChMC Children | Plural [s]/[h] | 77% (20/26) | 81% (82/101) | 83% (90/109) |
| | Ø | 23% (6/26) | 19% (19/101) | 17% (19/109) |
| ChWC Children | Plural [s]/[h] | 64% (14/22) | 44% (100/227) | 40% (50/125) |
| | Ø | 36% (8/22) | 56% (127/227) | 60% (75/125) |

Table 23 is consistent with data reported in Cepeda (1995) in that Chilean adult subjects

produce the plural morpheme more often on determiners and on N1 (bare nouns) than on

N2 (nouns followed by a determiner or numeral). ChMC adult speakers produced the

plural morpheme on Determiner 87% of the time and on N1 75% of the time while they

produced the plural morpheme on N2 only 55% of the time. Likewise, ChWC adult

speakers produced the plural morpheme on Determiner 68% of the time and on N1 68%

of the time while they produced the plural morpheme on N2 only 37% of the time. While

the production of the plural morpheme appears to be affected by whether or not a

previous element within the determiner phrase was already marked for plural in Chilean

adult speakers, this does not seem to affect the production of the plural morpheme in

Chilean children. ChMC children produced the plural morpheme on Determiner 77% of

the time, on N1 81% of the time, and on N2 83% of the time. Likewise, ChWC children

produced the plural morpheme on Determiner 64% of the time, on N1 44% of the time

and on N2 40% of the time. In this sense, while the existence of a previous element

marked for the plural within the determiner phrase affects plural morpheme production

on subsequent elements in Chilean adult speech, it does not appear to affect the

production of the plural morpheme in Chilean child speech.

### 4.5.4 The Effect of Number Information on Plural Morpheme Production

Our pilot data suggested that Chilean subjects may omit the plural morpheme

more often on nouns when the determiner phrase contained independent number

information in the form of plural quantifiers or numerals and this seems to be true given

that the logistic regression analysis showed that the factor group 'Independent Number

Information' added significantly to the model predicting plural morpheme omission.

Table 25 shows the percentage of plural morpheme omission and production on nouns

when the noun was headed by a plural quantifier or numeral (coded as 'Yes' in the table)

and when the noun was not headed by a plural quantifier or numeral (coded as 'No' in the

table). An example of noun phrases coded as 'Yes' and 'No' are shown in Table 24 below.

Table 24. Coding of Number Information in Production Data.

| YES | NO |
|---|---|
| todos los días<br>all.PL the.PL days.PL<br>'every day' | los días<br>the.PL days.PL<br>'the days' |
| muchos niños<br>many.PL children.PL<br>'many children' | unos niños<br>some.PL children.PL<br>'some children' |
| hartas personas<br>several.PL persons.PL<br>'many people' | algunos niños<br>some.PL children.PL<br>'some children' |
| 2 manzanas<br>2 apples.PL<br>'2 apples' | niños<br>children.PL<br>'children' |

Table 25 shows the effect of number information on plural morpheme production by Chilean subjects.

Table 25. The Effect of Number Information on Plural Morpheme Production.

|  | Yes | No |
|---|---|---|
| **ChMC Adults** | | |
| **[s]/[h]** | 56% | 63% |
|  | (42/75) | (165/263) |
| Ø | 44% | 37% |
|  | (33/75) | (98/263) |
| **ChWC Adults** | | |
| **[s]/[h]** | 31% | 54% |
|  | (13/42) | (61/113) |
| Ø | 69% | 46% |
|  | (29/42) | (52/113) |
| **ChMC Children** | | |
| **[s]/[h]** | 65% | 82% |
|  | (11/17) | (162/197) |
| Ø | 35% | 18% |
|  | (6/17) | (35/197) |
| **ChWC Children** | | |
| **[s]/[h]** | 50% | 42% |
|  | (6/12) | (145/342) |
| Ø | 50% | 58% |
|  | (6/12) | (197/342) |

The data presented in Table 25 reveal an increase in plural morpheme omission for ChWC adults and for ChMC children and a slight increase in omissions for ChMC adults when the noun is headed by a plural quantifier or numeral. On the other hand, no such increase in omissions is found for ChWC children. This data suggest that Chilean adults omit the plural morpheme more often when the noun is headed by a plural quantifier or numeral, in other words, when there is independent number information within the determiner phrase. In addition, the data suggest that only ChMC children, but not ChWC children, have acquired this constraint.

## 4.6    Summary of Results

The following is a summary of the results for the production data presented in this chapter.

1.  Chilean adult and Chilean child speakers have variable production of the plural morpheme, sometimes producing it as [s] and [h] and sometimes omitting it.

2.  Mexican adult and Mexican children speakers have systematic production of the plural morpheme, always producing it as an alveolar fricative ([s] and [z]).

3.  Chilean working-class children and adult speakers omit the plural morpheme more often than Chilean middle-class child and adult speakers.

4.  Chilean working-class children omit the plural morpheme more often than adult speakers and also more often than Chilean middle-class children.

5.  Chilean middle-class children produce the plural variant [s] more often than adult speakers and also more often than Chilean working-class children. Chilean middle-class children appear to overuse the [s] variant in comparison with the other three subject groups.

146

6. Chilean middle-class and Chilean working-class adult speakers appear to be constrained by Style, Independent Number Information, Syntactic Category, and Order in their omission of the plural morpheme.

7. Chilean working-class children do not appear to be constrained by Style, Order, nor Independent Number Information in their omission of the plural morpheme but they do appear to be constrained by Syntactic Category, omitting the plural morpheme more often on nouns than on determiners.

8. Chilean middle-class children do not appear to be constrained by Syntactic Category (i.e. nouns vs. determiners) nor Order in their *omission* of the plural morpheme but they do appear to be constrained by Style and Independent Number Information in their omission of the plural morpheme.

9. All Chilean adult and child groups appear to be constrained in their *production of the plural variants* [s] vs. [h] by both Syntactic Category (e.g. nouns vs. determiners) and Style (e.g. Free Speech vs. Repetition and Naming Tasks), using [s] more often on nouns than on determiners and also more often in careful speech (The Naming Task).

## 4.7    Discussion

This chapter had three main goals. First, it aimed to confirm previous reports on the patterns of plural morpheme production in Mexican and Chilean adult speakers by showing that Mexican adults are systematic in their production of the plural morpheme, always producing it as an alveolar fricative, while Chilean adults are variable in their production of the plural morpheme, producing it as both [s] and [h] and sometimes omitting it. The second goal was to compare the production of plural morphology by Chilean and Mexican children with that of their parents to determine whether there are

developmental differences in the acquisition of plural morphology in general. Finally, the third goal of this chapter was to compare the production of plural morphology between Chilean adults and children vs. Mexican adults and children to determine any differences between dialects. Ultimately, the overall purpose of these three goals is to determine how differences in the linguistic input to Mexican and Chilean children may affect production and comprehension of the plural morpheme in Chilean and Mexican children.

The data presented in this chapter confirms previous research on Mexican and Chilean adult speech by showing that Chilean speakers have variable behavior in their production of the plural morpheme while Mexican speakers systematically produce the plural morpheme as an alveolar fricative. In addition, the results showed that ChWC adults omitted the plural morpheme more often than ChMC adults. The data presented in Table 26 provides some examples of plural morpheme omission and production in Chilean adult speech.

Table 26. Free Speech Samples of Plural Morphology Produced by Chilean Adults.

| | Plural ([s]/[h]) | Omission of Plural |
|---|---|---|
| **Definites** | mi-[h] niñita-[ø]<br>my.PL daughter.PL<br>'my daughters' | Todo-[ø] lo-[ø] año-[ø]<br>all.PL    the.PL year.PL<br>'Every year' |
| **Indefinites** | uno-[h] año-[h]<br>some.PL years.PL<br>'some years' | uno-[ø] mese-[ø]<br>some.PL months.PL<br>'some months' |
| **Quantifiers** | de toda-[h] manera-[ø]<br>in all.PL    cases.PL<br>'in any case' | todo-[ø] lo-[h]  materiale-[h]<br>all.PL    the.PL materials.PL<br>'all of the materials' |
| **Nouns w/ Numerals** | treinta grado-[s]<br>thirty degrees.PL<br>'thirty degrees' | uno se va    do-[h] mese-[ø]<br>one    goes two    month.PL<br>'one goes for two months' |
| **Nouns w/ Determiners** | una-[h] muñeca-[s]<br>some.PL dolls.PL<br>'some dolls' | lo-[h] día-[ø]<br>the.PL days.PL<br>'the days' |
| **Adjectives** | tengo bueno-[h] recuerdo-[ø]<br>I.have good.PL    memory.PL<br>'I have good memories' | estamo-[ø][18] acostumbrado-[ø]<br>we are        accustomed.PL<br>'we are used to it' |
| **Bare Nouns** | no tengo    hermano-[h]<br>I don't have siblings.PL<br>'I don't have siblings' | tienen    actividade-[ø].....<br>they have activity.PL.....<br>'they have activities...' |

However, the reader should not rely solely on this chapter to be convinced of the differences in plural morpheme production in these two varieties of Spanish, especially given the small amount of data presented here. Instead, the reader should also consider previous reports on Chilean and Mexican Spanish (Cepeda 1995, Lipski 1994, Canfield 1982).

---

[18] /s/ omission on verbs, like *estamos* ('are.1.PL'), were not included in the analysis of this dissertation. The adjective *acostumbrados* ('accustomed.PL') was counted as not having a plural morpheme.

The data also show that no differences appear to exist between adult and child speakers with respect to the production of the plural morpheme, as Mexican children like Mexican adults were systematic in their own production and Chilean children like Chilean adults were variable in their own production. However, it does appear that for Chilean subjects there are differences between adult and child speakers with respect to the linguistic and extra-linguistic constraints that govern the variability in the production of the plural morpheme. The variability found in Chilean children is not identical to the variability found in Chilean adults, as noted above in the Chapter summary.

Finally, it is clear from the data presented here and in previous studies that the linguistic input to Chilean children differs drastically from the linguistic input to Mexican children with respect to plural morphology. Likewise, the data show that the linguistic input to ChWC children is also quite different from the linguistic input to ChMC children. More specifically, the data show that there are no omissions in the input to MexWC while plural morpheme omissions range from 33% (ChMC adults) to 44% (ChWC adults) in the input to Chilean children, providing Chilean children with a fair amount of ambiguous input. Given these differences in input and the fact that all three child groups patterned differently in their own production, the next important question is whether MexWC children, ChMC children and ChWC children will pattern differently in their comprehension of the plural morpheme. Or, is the fact that the plural is marked between 50% - 65% of the time enough for Chilean child subjects to associate the plural morpheme to an interpretation of 'more than one'. This question will be addressed in a series of experimental studies on comprehension presented in the following chapter.

CHAPTER 5

COMPREHENSION OF PLURAL MORPHOLOGY

5.0     Introduction

The production data presented in Chapter 4 showed that Chilean children were

variable in their production of the plural morpheme while Mexican children were

systematic, always producing the plural morpheme as an alveolar fricative. Within the

Chilean child groups, the data showed that ChWC children omitted the plural morpheme

much more often than ChMC children. This data alone suggests very strongly that

ChWC, ChMC and Mexican children are receiving very different linguistic input with

respect to the plural morpheme. The production data collected from Mexican and Chilean

adults confirm that differences in the input between the three groups exist. However, the

data also show that Chilean children, although variable in their production of the plural

morpheme, have not yet acquired all of the various linguistic and extra-linguistic

constraints governing that variability. These findings are consistent with previous

research on child acquisition of linguistic variability, which shows that variable input

results in variable production in children, yet even by 6 years of age children have not

acquired all of the constraints governing the variability (Kovac and Adamson 1981,

Roberts 1994, 1997, Smith et al. 2006).

What about comprehension of grammatical forms that are variable in the input?

Chilean and Mexican children differ in their production of the plural morpheme, will they

also differ in their comprehension of the plural morpheme? The production data

presented in Chapter 4 showed that both Chilean and Mexican subjects produced the

plural morpheme some of the time, with the difference being that the Chilean subjects

151

produced the plural morpheme as [s] and also as [h] and they also omitted the plural morpheme some of the time. The production data show that Chilean children receive an input with [s] as the plural morpheme some of the time. Will they associate [s] to an interpretation of 'more than one'? The production data also show that Chilean children receive an input with [h] as the plural morpheme some of the time. Will they also associate [h] to an interpretation of 'more than one'? Or, will the ambiguous nature of the input due to the omission of the plural morpheme, delay Chilean child comprehension of plural morphology?

The Variability Delay Hypothesis, which was presented in Chapter 1 of this dissertation and is restated below in (1) predicts that Chilean children will differ from Mexican children in their comprehension of the plural morpheme. More specifically, it predicts that Chilean children will have a delay in their comprehension of plural morphology.

(1)    Variability Delay Hypothesis (based on Yang 2000, 2002): Variability in the input will delay child comprehension of grammatical morphemes when the variability causes an ambiguity in the input (involves a zero form) and is constrained not only by linguistic (phonological, grammatical) but also extra-linguistic (SES, age, sex) factors.

The Variability Delay Hypothesis is adapted from Yang's (2000, 2002) Variation Model of language acquisition, which proposes an approach to language acquisition that is based on a competition between a finite set of grammars. The set of grammars in competition is determined by the interaction between the biological constraints on human grammar

(UG) and the properties of linguistic data in the environment during the course of language acquisition. His competition-based model proposes that each grammar is associated with a weight, which denotes the probability with which the child acquiring the language accesses that particular grammar. When the child is presented with an utterance, he selects a grammar in order to analyze the utterance. The probability that a particular grammar is selected is based on its weight. If the child can parse the utterance with this grammar, the grammar is rewarded and all of the other grammars are indirectly punished. If the grammar is unable to parse the utterance, it is punished and all the other grammars are indirectly rewarded. By examining the relative frequency of structures within a sample of input data, it is possible theoretically to determine which grammars will not be able to parse the structures in the input and hence end up being grammars that are punished and not selected later on. Ambiguous input would cause a delay in acquisition, as the child would be rewarding more than one grammar.

With respect to plural morphology, I do not assume that Chilean children have two competing grammars, one with a projection above DP where number is interpreted and one that does not have a projection above DP. Instead, the problem that Chilean children might face is to learn whether the underlying representation associated to 'more than one' is overtly marked or not. In other words, the issue is matching different phonological forms to an underlying representation of number and that the competition occurs between the two or more phonological forms that will ultimately be matched to the underlying representation. Phonological forms associated with number that are systematically produced in the adult speech (e.g. lexical quantifiers, numerals) will be matched to the underlying form more quickly than ambiguous phonological forms (i.e.

those that are sometimes produced and sometimes omitted in the input of adult speakers to children, as is the case for the Chilean plural morpheme). Ultimately, the phonological form that is initially matched to the underlying representation will affect the grammar the child is constructing. Either the child initially constructs a grammar that marks number morphologically, as in English, or the child initially constructs a grammar that marks number lexically, as in Chinese. As a result, the hypothesis predicts a delay in the acquisition of grammatical forms (i.e. mapping of those forms to an underlying representation) that are ambiguous.

At this point, it is important to note that any results we find for Chilean children will be inconclusive unless we also test the comprehension of plural morphology by Mexican children, who are exposed to systematic input. Until we know what the general patterns for the comprehension of Spanish plural morphology are when the input is systematic, we cannot interpret the results for Chilean children. For this reason, both Chilean and Mexican comprehension data is needed in order to answer the questions posed above.

5.1     Study 1. Act-out Task: Indefinite Noun Phrase

5.1.1   Background

Study 1 investigates Chilean and Mexican children's interpretation of plural and singular indefinite noun phrases like those in sentences (2) and (3) by examining children's ability to give plural responses based on the type of indefinite determiner and the presence or absence of the plural morpheme.

(2) a. Pon <u>una    bolita</u>    en la caja.

Put  a/one.SG marble.SG in the box

'Put a/one marble in the box.'


b. Pon <u>unas    bolitas</u>    en la caja.

Put  some.PL marbles.PL in the box

'Put some marbles in the box'


c. Pon <u>algunas bolitas</u>    en la  caja.

Put  some.PL marbles.PL in the box

'Put some marbles in the box.'


(3) a. Pon <u>una    de las   bolitas</u>    en la caja.

Put  a/one.SG of the.PL marbles.PL in the box

'Put a/one of the marbles in the box.'


b. Pon <u>algunas de las    bolitas</u>    en la  caja.

Put  some.PL of the.PL marble.PL in the box

'Put some of the marbles in the box.'


Sentences (2a) and (3a) are associated to an interpretation of 'one' while sentences (2b), (2c), and (3b) are associated to an interpretation of 'more than one'. Both masculine and feminine noun phrases were examined. For feminine nouns only the plural morpheme

155

provides number information (una.F.SG bolita.F.SG vs. unas.F.PL bolitas.F.PL). For masculine noun phrases the form of the indefinite determiner is different in the plural vs. the singular condition (un.M.SG auto.M.SG vs. unos.M.PL autos.M.PL). The singular indefinite noun phrase in (2a) also has a number interpretation: it can mean 'a marble' or 'one marble'. Given the context of Study 1, both plural indefinites *unos* and *algunos* are felicitous and require a 'more than one' interpretation while the singular indefinite *un* requires an interpretation of 'one'. The experimental sentences in (3) test overt partitives. While the nouns inside the prepositional phrase in the partitive constructions in (3a) and (3b) are both marked with a plural morpheme, (3a) is associated to an interpretation of 'one' and (3b) is associated to an interpretation of 'more than one'. It should be noted that while the Spanish adult grammar allows the singular form of (3b) (*alguno de los* 'one of the'), it does not allow a plural form of (3a) (**unos de los* 'some of the').

As noted above, the input with respect to plural morphology is different for Chilean working-class children (ChWC) vs. Chilean middle-class children (ChMC) vs. Mexican working-class children (MexWC); MexWC children receive systematic input with respect to plural morphology and Chilean children receive variable input. Table 27 from Chapter 4 is placed again here to remind the reader of the overall differences in plural morpheme production between the three varieties of Spanish.

Table 27. Percentage of Plural Responses for Production Data.

|  |  | Morpheme ([s] or [h]) | Omission (∅) | Total Plural Tokens |
|---|---|---|---|---|
| **ChMC** | **Adults** | 67% (433) | 33% (213) | 100% (646) |
|  | **Children** | 83% (278) | 17% (58) | 100% (336) |
| **ChWC** | **Adults** | 56% (145) | 44% (113) | 100% (258) |
|  | **Children** | 42% (212) | 58% (287) | 100% (499) |
| **MexMC** | **Adults** | 99% (335) | 1% (5) | 100% (340) |
| **MexWC** | **Adults** | 99% (430) | 1% (3) | 100% (433) |
|  | **Children** | 99% (532) | 1% (3) | 100% (535) |

Study 1 asks the following questions: (1) Given the differences in the input, will Chilean children differ from Mexican children in their comprehension of indefinite plural noun phrases? (2) Will Chilean children with variable input associate the plural morpheme to an interpretation of 'more than one'? (3) Will Chilean children treat both [s] and [h] as associated to an interpretation of 'more than one'. (4) Given that the plural masculine noun phrase has a different form than the singular masculine noun phrase (e.g. *un auto* vs. *unos autos*), will children perform better on masculine noun phrases than on feminine noun phrases?

## 5.1.2 Method and Design

An Act-out Task was used. Subjects were presented with sets of miniature toys (6 toys per set) followed by sentences as in (2) – (3) above. There were three plural targets (2b, 2c, 3b) and two singular targets (2a, 3a). The noun phrases under investigation were

always in object position, rather than in subject position where they would trigger

subject-verb agreement. Placing the noun phrase in object position, guarantees that only

the plural morpheme on the noun provides number information. Furthermore, placing the

object in sentence final position, guarantees very little memory burden for the child. The

task procedure was very simple and matched very closely to children's everyday

language experiences. Ferenz and Prasada (2002) showed that children as young as 1;9

years of age can carry out this type of task with very little difficulty.

Because Cepeda (1995) found that syllable final /s/ was omitted more often in

certain phonological environments, the initial sound of the nouns was controlled for in

order to include environments where the determiner preceded sounds that favored both

omission and production of the plural morpheme. Cepeda's findings are shown again in

Table 28.

Table 28. Lenition of Syllable Final /s/ by Phonological Environment.

|  | __#C [-cont] | __#C [+cont] | __#C [+nas] | __#V (Unstressed) | __#V (Stressed) | __## (Pause) |
|---|---|---|---|---|---|---|
| [s] | 1% | 1% | 1% | 6% | 25% | 12% |
| [h] | 83% | 55% | 71% | 42% | 38% | 35% |
| Omission | 16% | 44% | 28% | 52% | 36% | 54% |
| Total | 3594 | 3552 | 1406 | 2716 | 1018 | 3831 |

*Adapted from Cepeda (1995).

The nouns used in this study with Chilean children were: *arañas* 'spiders' (unstressed

vowel), *autos* 'cars' (stressed vowel), *bolitas* 'marbles' (+ continuant consonant), *monitos*

'monkeys' (nasal consonant) and for Mexican children: *arañas* 'spiders', *anillos* 'rings', *vacas* 'cows', *perros* 'dogs'. Because the names for these items differ across the two dialects, the same items could not always be used (e.g. in Chile *monos* but in Mexico *changos* means 'monkey').

In addition, gender was controlled for. Two nouns were feminine and the other two were masculine for each indefinite condition. For the feminine indefinites, only the plural morpheme provides number information (4a – 4b). For the masculine indefinites the form of the determiner is also different in the singular vs. plural conditions (5a – 5b).

(4)    a.     una       bolita

              a/one.F.SG marble.F.SG

              'a/one marble'

    b.     unas      bolitas

              some.F.PL marbles.F.PL

              'some marbles'

(5)    a.     un        mono

              a/one.M.SG monkey.M.SG

              'a/one monkey'

b.    unos    monos

some.M.PL monkeys.M.PL

'some monkeys'


Chilean children were tested either with the plural morpheme pronounced as [s] or as [h] while Mexican children were only tested on the alveolar fricative.

Controls involved the quantifiers *muchos* (many.PL), *pocos* (few.PL), and *todos* (all.PL). While *todos* (all.PL) requires an interpretation of 'more than one' where children put the maximal set of items in the box, *muchos* (many.PL) requires a 'more than one' interpretation yet the maximal set of items is not required, but optional. Finally, although *pocos* (few.PL) has a plural morpheme, in this context it is possible to respond with a 'more than one' or 'one' interpretation (*Pon pocas bolitas en la caja* "Put few marbles in the box"). Subjects could perform perfectly on the controls even if they ignore the plural morpheme. In addition, all children were tested on the numbers *dos* (two) and *tres* (three) and their ability to count to seven.

## 5.1.3   Subjects

89 children participated in this experiment. For 19 MexWC (4;7-6;5), 36 ChWC (4;7-7;3), 34 ChMC (4;8-8;2) children and 10 Chilean adults (5 ChWC and 5 ChMC) and 6 Mexican adults (3 MexWC and 3 MexMC) the plural morpheme was always pronounced by the researcher as [s] in the experiment. In addition, for 11 ChWC (4;9-6;4) and 9 ChMC (5;1-6;1) children the researcher pronounced the plural morpheme as [h] in the experiment. The plural morpheme was pronounced as [h] only for Chilean

children, and not Mexican children, given that Chilean adults, but not Mexican adults, sometimes pronounce the plural morpheme as [h].

The Chilean children were recruited from preschools and daycares in Punta Arenas, Chile and the Mexican children from a daycare in Mexico City. All ChWC, ChMC and MexWC adult subjects were the parents of children who participated in this study. Three additional MexMC adult subjects were interviewed to ensure that MexWC and MexMC adult comprehension of the plural morpheme did not differ. Children were divided into two age groups in the version of the experiment where the researcher pronounced the plural morpheme as [s], an older and younger age group. In the version of the experiment where the researcher pronounced the plural morpheme as [h], children were not divided by age group. This decision was based primarily on the fact that there were not enough subjects to divide for age. Table 29 shows the distribution of children who participated in Study 1.

Table 29. Study 1: Distribution of Children.

|  | Pronunciation | Group | Number | Age Range | Mean Age |
|---|---|---|---|---|---|
| **MexWC** | [s] | Younger | 14 | 4;7-5;10 | 5;2 |
|  | [s] | Older | 5 | 6;0-6;5 | 6;3 |
| **ChMC** | [s] | Younger | 15 | 4;8-5;11 | 5;2 |
|  | [s] | Older | 10 | 6;0-7;3 | 6;7 |
|  | [h] | ----- | 9 | 5;1-6;1 | 5;7 |
| **ChWC** | [s] | Younger | 15 | 4;7-5;11 | 5;3 |
|  | [s] | Older | 10 | 6;7-8;2 | 7;4 |
|  | [h] | ----- | 11 | 4;9-6;4 | 5;6 |

The distribution and mean age of the younger-[s] children (younger children who heard the plural pronounced as [s] in the experiment) is similar across all three child groups. All of these children were in preschool or kindergarten and had not yet received any formal reading education. However, this is not true for the older children, where the distribution and mean age differs across the three groups, with the older MexWC children being approximately 4 – 13 months *younger* than the older ChMC and ChWC children (based on mean age). In addition, although the older MexWC children were in kindergarten and had not yet received any reading instruction, the Chilean children were in first and second grade and had received reading instruction. For this reason, any

comparisons made between the older child groups, must take into consideration the different levels of education and age.

## 5.1.4 Procedure

All subjects were tested by native Spanish speakers who lived in the same city as the subjects. The author of this dissertation was present during the testing of all children to ensure that procedures were identical for all subjects. The experimenter started the testing session by placing 7 miniature puppies in a row in front of the child and asking the child to count the puppies. Children were then asked to place two puppies (*dos perritos*) and then three puppies (*tres perritos*) in a small box. Of the 91 children invited to participate in this study, there were only two children who did not pass this warm-up task, leaving a total of 89 child subjects. Next, the experimenter presented each child with two sets of objects (*autos* 'cars' and *bolitas* 'marbles') and told each child: "*Te voy a decir cuántas bolitas y cuántos autos tienes que poner en la caja y tu pones la cantidad que yo te digo, te parece?*" ("I'm going to tell you how many marbles and how many cars you have to put in the box and you put in the quantity that I tell you, sound good?") The experimenter then began running the main section of the experiment, which involved target and control conditions. The test was administered the same way for adults; however, they were not tested on their ability to count, number terms nor controls.

A within subjects design was used. There were four trials of each target sentence and four trials of each control sentence, making a total of 32 experimental sentences. All experimental sentences were presented in pseudorandom order and sentences involving the same determiner never immediately followed each other.

In addition to this task, there was a follow-up highlighting task that was administered only to children who consistently responded incorrectly in the plural conditions *unos, algunos,* or *algunos de los* by associating the plural indefinite to an interpretation of 'one' (by only putting one item in the box). Children who provided a singular response in at least 3 out of 4 trials in any one of the three plural conditions were presented with the highlighting task illustrated in Table 30. The goal was to ensure that children were focused on the phonological difference between the singular and plural nouns. Note that this Highlighting Task only highlighted the plural morpheme on the plural indefinite *unos,* but not on *algunos* nor *algunos de los.*

Table 30. Study 1: Highlighting Task.

| | |
|---|---|
| **Researcher:** | "Ahora escucha bien. SSSSSSS BOLITASSS tiene 's' al final. BOLITA y BOLITAS. ¿Te das cuenta? A ver, BOLITA. Repítelo. (child repeats) y BOLITAS (child repeats). Ahora, Pon UNAS BOLITAS en la caja (child responds). Y ahora pon UNA BOLITA en la caja (child responds)." |
| **Researcher:** | "Now listen. SSSSS MARBLESSS has an 's' at the end. MARBLE and MARBLESSSS, Do you hear that? Let's see, MARBLE. Repeat it (child repeats) and MARBLESSS (child repeats). Now, Put SOME MARBLES in the box (child responds). And now put A/ONE MARBLE in the box (child responds)." |

## 5.1.5 Results

There were no differences found between Chilean and Mexican adults. Both adult groups always associated the plural indefinites to an interpretation of 'more than one' and the singular indefinites to an interpretation of 'one'. Although all three child groups performed the same on the controls, they did not all perform the same in the target conditions. The dependent variable was the number of plural responses children gave. Putting more than one item into the box was considered a plural response. Putting only one item in the box was considered a singular response. The mistakes that children made in the plural conditions were always the same, they only put one item in the box. Table 31 shows the overall percentage of plural responses for control conditions.

## Table 31. Study 1: Plural Responses in Control Conditions.

### Plural Morpheme Pronounced as [s]

| YOUNGER | *todos* 'all.PL' | *muchos* 'many.PL' | *pocos* 'few.PL' |
|---|---|---|---|
| MexWC | 100% (56/56) | 100% (56/56) | 75% (42/56) |
| ChMC | 100% (60/60) | 100% (60/60) | 80% (48/60) |
| ChWC | 100% (60/60) | 100% (60/60) | 73% (44/60) |

| OLDER | *todos* 'all.PL' | *muchos* 'many.PL' | *pocos* 'few.PL' |
|---|---|---|---|
| MexWC | 100% (20/20) | 100% (20/20) | 70% (14/20) |
| ChMC | 100% (40/40) | 100% (40/40) | 75% (30/40) |
| ChWC | 100% (40/40) | 100% (40/40) | 70% (28/40) |

### Plural Morpheme Pronounced as [h]

| | *todos* 'all.PL' | *muchos* 'many.PL' | *pocos* 'few.PL' |
|---|---|---|---|
| ChWC | 100% (44/44) | 100% (44/44) | 82% (36/44) |
| ChMC | 100% (36/36) | 100% (36/36) | 61% (22/36) |

166

All three child groups in both the [s] and [h] version of the study assigned plural readings to the controls *todos* ('all.PL') and *muchos* ('many.PL') 100% of the time. Although there was a tendency to assign plural readings to *pocos* ('few.pl), this was not required by the context and a one-way ANOVA showed no significant differences between the three younger-[s] child groups $(F(2,42)=.147, p = .864)$, nor the three older-[s] child groups $(F(2,24)=.052, p = .949)$, nor between the ChWC and ChMC children tested on [h] $(F(1,19)=1.084, p = .312)$. While children performed similarly in the Control conditions, they did not perform the same in the Target conditions. Table 32 shows the percentage of plural responses in the target conditions.[19]

---

[19] Phonological environment of the nouns used in the experiment did not affect child comprehenesion of the plural morpheme.

Table 32. Study 1: Plural Responses in Target Conditions.

| | *unos* some.PL | *un* a/one.SG | *algunos* some.PL | *alg de los* some.PL of the.PL | *uno de los* one.SG of the.PL |
|---|---|---|---|---|---|
| **Adults** | 100% (64/64) | 0% (0/64) | 100% (64/64) | 100% (0/64) | 0% (0/64) |

**Plural Morpheme Pronounced as [s]**
**Younger Children**

| | | | | | |
|---|---|---|---|---|---|
| **MexWC** | 77% (43/56) | 0% (0/56) | 77% (43/56) | 52% (29/56) | 14% (8/56) |
| **ChMC** | 65% (39/60) | 0% (0/60) | 88% (53/60) | 87% (52/60) | 38% (23/60) |
| **ChWC** | 32% (19/60) | 0% (0/60) | 38% (23/60) | 35% (21/60) | 10% (6/60) |

**Plural Morpheme Pronounced as [s]**
**Older Children**

| | | | | | |
|---|---|---|---|---|---|
| **MexWC** | 95% (19/20) | 0% (0/20) | 100% (20/20) | 90% (18/20) | 10% (2/20) |
| **ChMC** | 90% (36/40) | 0% (0/40) | 90% (36/40) | 88% (35/40) | 0% (0/40) |
| **ChWC** | 75% (30/40) | 0% (0/40) | 78% (31/40) | 70% (28/40) | 8% (3/40) |

**Plural Morpheme Pronounced as [h]**

| | | | | | |
|---|---|---|---|---|---|
| **ChMC** | 31% (11/36) | 0% (0/36) | 53% (19/36) | 25% (9/36) | 8% (3/36) |
| **ChWC** | 23% (10/44) | 7% (3/44) | 36% (16/44) | 39% (17/44) | 28% (10/44) |

Within every group (both Mexican and Chilean, older and younger), there were children

who associated the plural indefinites *unos* ('some.PL'), *algunos* ('some.PL'), and *algunos*

*de los* ('some.PL of the.PL') to an interpretation of 'more than one'; however, the groups

differed significantly in how often they associated the plural indefinite to an

interpretation of 'more than one'.

*Unos.* The number of plural responses for each child was examined for the three

plural conditions: *unos, algunos,* and *algunos de los.* In the *unos* condition a one-way

ANOVA showed significant differences between younger-[s] ChWC, younger-[s] ChMC,

younger-[s] MexWC and Adult subjects ($F(3,59)=10.385, p<.001$). Post hoc Bonferroni

tests showed that the only younger-[s] groups that behaved significantly different from

adults were the younger-[s] ChWC children ($p<.001$) and younger-[s] ChMC children

($p<.05$). Mexican children did not behave significantly different from adults ($p=.434$).

Post hoc Bonferroni tests also showed for the younger-[s] child groups that only younger-

[s] MexWC and younger-[s] ChWC children differed significantly from each other

($p<.01$). Younger-[s] ChMC children did not behave significantly different from

younger-[s] MexWC nor younger-[s] ChWC children (ChWC vs. ChMC: $p=.065$,

MexWC vs. ChMC: $p=1.0$). Turning now to the older-[s] children groups a one-way

ANOVA showed no significant differences between the older-[s] ChWC, older-[s]

ChMC, older-[s] MexWC and Adult groups ($F(3,40)=1.890, p=.148$). Finally, if we look

at the ChWC and ChMC tested on [h], we find no significant differences between these

two groups ($t(1,18)=-.433, p=.633$). Child responses were not compared to adult responses

given that we did not test adults on [h].

Given that we find no differences between the ChWC vs. ChMC children when

the plural is pronounced as [s] or when it is pronounced as [h], the next step is to

determine whether there are significant differences in the younger ChWC and the

younger ChMC child behavior when the plural is pronounced as [s] as compared to [h]. For the ChMC children, there is a marginally significant decrease in plural responses on *unos* ('some.PL') when the plural is pronounced as [h] (t(1,22)=2.027,p=.055). For the ChWC children, although there was a decrease in the amount of plural responses provided when the plural was pronounced as [h], this difference was not significant (t(1,24)=.528,p=.602). In other words, neither ChWC nor ChMC children improved on *unos* ('some.PL') when the plural morpheme was pronounced as [h].

To determine whether there was an age effect, the younger-[s] children were compared to the older-[s] children. The results show an age effect for the ChWC children (t(1,23)=-2.418,p<.05) but no age effect for ChMC children (t(1,23)=-1.629,p=.117) and no age effect for MexWC children (t(1,17)=-1.137,p=.271).

Finally, in order to determine whether the same children always treated the plural indefinite *unos* as plural or whether behavior was variable for each child, we examined the systematicity in response patterns on *unos* for each child, as shown in Table 33. We are defining systematic behavior as having the same response (plural or singular) in at least 3 out of 4 trials. Variable comprehension would be having a singular response for 2 of the 4 trials and a plural response for the other 2 of 4 trials.

Table 33. Study 1: *Unos*: Systematic Responders.

| | Systematic Plural Response (3-4 plural) | Systematic Singular Response (3-4 singular) | Systematic Total | Variable Plural Response (2 pl/ 2 sg) |
|---|---|---|---|---|
| **Plural Pronounced as [s]** | | | | |
| **Younger** | | | | |
| **MexWC** | 86% | 14% | 100% | 0% |
| **ChMC** | 53% | 33% | 86% | 13% |
| **ChWC** | 27% | 67% | 94% | 6% |
| **Older** | | | | |
| **MexWC** | 100% | 0% | 100% | 0% |
| **ChMC** | 90% | 10% | 100% | 0% |
| **ChWC** | 70% | 20% | 80% | 10% |
| **Plural Pronounced as [h]** | | | | |
| **ChMC** | 22% | 56% | 78% | 22% |
| **ChWC** | 27% | 73% | 100% | 0% |

Table 33 shows that children in general were consistent in their responses. Children either always selected a plural set of objects or a single object in at least 3 out of 4 trials. In other words, they always treated the plural *unos* ('some.pl') as plural or always as singular. Very few children treated it as plural half the time (in 2 trials) and as singular half the time (in 2 trials).

*Algunos.* In the *algunos* condition a one-way ANOVA showed significant differences between younger-[s] ChWC, younger-[s] ChMC, younger-[s] MexWC and Adult subjects (F(3,59)=13.162,p<.001). Post hoc Bonferroni tests showed that only the younger-[s] ChWC children behaved significantly different from adults (p<.001). Younger-[s] ChMC (p=1.0) and younger-[s] MexWC children (p=.191) did not behave significantly different from adults. Post hoc Bonferroni tests also showed that while the younger-[s] ChWC children behaved significantly different from both younger-[s] ChMC (p<.001) and MexWC children (p<.01), the ChMC and MexWC children did not behave differently from each other (p=1.0). Turning now to the older-[s] children groups a one-way ANOVA showed no significant differences between the older-[s] ChWC, older-[s] ChMC, older-[s] MexWC and Adult groups (F(3,40)=1.751,p=.174). Finally, if we look at the ChWC and ChMC tested on [h], we find no significant differences between these two groups (t(1,18)=-.649,p=.524). Child responses were not compared to adult responses given that we did not test adults on [h].

Next we will determine whether there are significant differences in the younger ChWC and younger ChMC child behavior when the plural is pronounced as [s] as compared to [h]. For the ChMC children, there is a significant decrease in plural responses on *algunos* ('some.PL') when the plural is pronounced as [h] (t(1,22)=2.423,p<.05). For the ChWC children, although there was a decrease in the amount of plural responses provided when the plural was pronounced as [h], this difference was not significant (t(1,24)=.-.017,p=.987). In other words, neither ChWC nor ChMC children improved on *algunos* ('some.PL') when the plural morpheme was pronounced as [h], instead ChMC children had a decrease in plural responses.

172

To determine whether there was an age effect, the younger-[s] children were compared to the older-[s] children. The results show an age effect for the ChWC children ($t(1,23)=-2.222, p<.05$) but no age effect for ChMC children ($t(1,23)=-.159, p=.875$) and no age effect for MexWC children ($t(1,17)=-1.606, p=.127$).

Finally, in order to determine whether the same children always treated the plural indefinite *algunos* as plural or whether behavior was variable for each child, we examined the systematicity in response patterns on *algunos* for each child, shown in Table 34. We are defining systematic as having the same response (plural or singular) in at least 3 out of 4 trials. Variable would be having a singular response in 2 of 4 trials and also a plural response in 2 of 4 trials.

Table 34. Study 1: *Algunos*: Systematic Responders.

|  | Systematic Plural Response (3-4 plural) | Systematic Singular Response (3-4 singular) | Systematic Total | Variable Plural Response (2 pl/ 2 sg) |
|---|---|---|---|---|
| **Plural Pronounced as [s]** | | | | |
| **Younger** | | | | |
| **MexWC** | 79% | 14% | 93% | 7% |
| **ChMC** | 93% | 7% | 100% | 0% |
| **ChWC** | 33% | 60% | 93% | 7% |
| **Older** | | | | |
| **MexWC** | 100% | 0% | 100% | 0% |
| **ChMC** | 90% | 10% | 100% | 0% |
| **ChWC** | 80% | 20% | 100% | 0% |
| **Plural Pronounced as [h]** | | | | |
| **ChMC** | 55% | 45% | 100% | 0% |
| **ChWC** | 37% | 54% | 91% | 9% |

The results show that overall children are systematic in their response patterns, either always associating *algunos* with an interpretation of 'more than one' or always associating *algunos* with an interpretation of 'one'.

*Algunos de los*. In the *algunos de los* condition a one-way ANOVA showed significant differences between younger-[s] ChWC, younger-[s] ChMC, younger-[s]

MexWC and Adult subjects (F(3,59)=12.627,p<.001). Post hoc Bonferroni tests showed that the only younger-[s] groups that behaved significantly different from adults were the younger-[s] ChWC children (p<.001) and the younger-[s] MexWC children (p<.001). Younger-[s] ChMC (p=1.0) did not behave significantly different from adults. Post hoc Bonferroni tests also showed that while the younger-[s] ChMC children behaved significantly different from both younger-[s] ChWC (p<.001) and MexWC children (p<.05), the ChWC and MexWC children did not behave differently from each other (p=1.0). In other words, younger-[s] ChWC and MexWC children performed the same on *algunos de los* and differently from the ChMC children. Turning now to the older-[s] children groups a one-way ANOVA showed significant differences between the older-[s] ChWC, older-[s] ChMC, older-[s] MexWC and Adult groups (F(3,40)=2.941,p<.05). Post hoc Bonferroni tests showed that only older-ChWC children behaved significantly different from adults (p<.05) while older-ChMC (p=1.0) and older-MexWC (p=1.0) children did not. However, the three older-child groups did not differ significantly different from each other (older-ChWC vs. older-ChMC: p=.765; older-ChWC vs. older-MexWC: p=.925; older-ChMC vs. older-MexWC: p=1.0).

The next step is to determine whether there are significant differences in the younger ChWC and younger ChMC child behavior when the plural is pronounced as [s] as compared to [h]. The plural overt partitive will sound different in the [s] and [h] studies because both the indefinite *algunos* ('some.PL') and the definite determiner *los* ('the.PL') will both occur with either [s] or with [h]. For the ChMC children, there is a significant decrease in plural responses on *algunos de los* ('some.PL of the.PL') when the plural is pronounced as [h] (t(1,22)=4.871,p<.001). For the ChWC children there is no

difference in plural responses on *algunos de los* when the plural is pronounced as [s] or [h] (t(1,24)=-.077,p=.939). In other words, neither ChWC nor ChMC children improved on *algunos de los* ('some.PL of the.PL') when the plural morpheme was pronounced as [h], rather the ChMC children provided significantly less plural responses when the plural was pronounced as [h]. This is interesting because it suggests that ChMC children prefer [s] as the plural morpheme and some are treating *algunoh de loh* (with aspiration) as if there is not plural morpheme there, as if it is *alguno de los* ('one.SG. of the.PL'), which is possible in adult Spanish.

To determine whether there was an age effect in the *algunos de los* condition, the younger-[s] children were compared to the older-[s] children. The results show a marginal age effect for the ChWC children (t(1,23)=-2.006,p=.057) but no age effect for ChMC children (t(1,23)=-.074,p=.942) and no age effect for MexWC children (t(1,17)=-1.910,p=.073).

Finally, in order to determine whether the same children always treated the plural indefinite *algunos de los* as plural or whether behavior was variable for each child, we examined the systematicity in response patterns on *algunos de los* for each child, as shown in Table 35. We are defining systematic as having the same response (plural or singular) in at least 3 out of 4 trials. Variable plural responses are when children assigned a plural reading in 2 of 4 trials and also a singular reading in 2 of 4 trials.

Table 35. Study 1: *Algunos de los*: Systematic Responders.

| | Systematic Plural Response (3-4 plural) | Systematic Singular Response (3-4 singular) | Systematic Total | Variable Plural Response (2 pl/ 2 sg) |
|---|---|---|---|---|
| **Plural Pronounced as [s]** | | | | |
| **Younger** | | | | |
| MexWC | 43% | 43% | 86% | 14% |
| ChMC | 87% | 7% | 94% | 7% |
| ChWC | 33% | 60% | 93% | 7% |
| **Older** | | | | |
| MexWC | 100% | 0% | 100% | 0% |
| ChMC | 80% | 10% | 90% | 10% |
| ChWC | 60% | 20% | 80% | 20% |
| **Plural Pronounced as [h]** | | | | |
| ChMC | 11% | 78% | 89% | 11% |
| ChWC | 36% | 63% | 100% | 0% |

Table 35 shows that for the most part all children were systematic in their responses, either always associating the plural partitive to a 'more than one' interpretation or always associating it to an interpretation of 'one'. The largest percentage of variable responders come from the Older-[s] ChWC and Younger MexWC groups where 2 children in each group were variable in their responses.

Turning next to the two singular conditions, *un* and *uno de los,* we find that all

groups performed at ceiling on the singular indefinite condition *un* and were systematic

in their responses, as shown in Table 36.

Table 36. Study 1: *Un*: Systematic Responders.

| | Systematic Plural Response (3-4 plural) | Systematic Singular Response (3-4 singular) | Systematic Total | Variable Plural Response (2 pl/ 2sg) |
|---|---|---|---|---|
| **Plural Pronounced as [s]** | | | | |
| **Younger** | | | | |
| MexWC | 0% | 100% | 100% | 0% |
| ChMC | 0% | 100% | 100% | 0% |
| ChWC | 0% | 100% | 100% | 0% |
| **Older** | | | | |
| MexWC | 0% | 100% | 100% | 0% |
| ChMC | 0% | 100% | 100% | 0% |
| ChWC | 0% | 100% | 100% | 0% |
| **Plural Pronounced as [h]** | | | | |
| ChMC | 0% | 100% | 100% | 0% |
| ChWC | 0% | 100% | 100% | 0% |

*Uno de los.* For the younger-[s] children a one-way ANOVA showed significant differences between the younger-[s] ChMC, ChWC, and MexWC children and Adults ($F(3,59)=8.690$, $p<.001$). Post hoc Bonferroni tests showed that only the younger-[s] ChMC children ($p<.001$), but not the younger-[s] ChWC ($p=.806$) nor MexWC ($p=.438$), performed significantly different from adults. The younger-[s] ChMC children performed significantly differently from the other two younger-[s] child groups: ChWC ($p<.01$), MexWC ($.05$). The younger-[s] ChWC and MexWC children did not behave significantly different from each other ($p=1.0$). For the older-[s] children a one-way ANOVA showed no significant differences between groups (ChWC, ChMC, MexWC, Adults) ($f(3,40)=1.617$, $p=.202$). Comparing Chilean children who participated in the part of the study where the plural was pronounced as [h] we find that ChWC and ChMC children did not behave significantly different from each other ($t(1,18)=.978$, $p=.341$). Adults were not included in this statistic because they were not tested on their comprehension of [h] as the plural morpheme.

The next step is to see whether the Chilean children who heard the plural morpheme pronounced as [s] performed differently than the Chilean children who heard it pronounced as [h]. The difference in pronunciation of the plural morpheme affected the singular condition *uno de los* ('one.SG of the.PL') in that the definite article *los* in this partitive is plural. However, the pronunciation of *uno* in the overt partitive was the same in the [h] and [s] parts of the study. Although there was a slight increase in plural responses in the [h] experiment for ChWC children, these differences were not significant ($t(1,24)=-.928$, $p=.363$). However there were significant differences between ChMC children who heard the plural morpheme pronounced as [s] vs. those who heard it

pronounced as [h] (t(1,22)=-2.370,p<.05), with [s]-ChMC children treating *uno de los* as plural significantly more often than [h]-ChMC children. It appears as if the ChMC children are hypercorrecting, assuming that the researcher is omitting the plural morpheme in the [s] part of the study but not the [h] part of the study.

Turning now to possible age effects, the results showed that there were no age effects for the ChWC children (t(1,23)=.208,p=.837) nor the MexWC children (t(1,17)=.527,p=.605) but there was as significant age effect for the ChMC (t(1,23)=2.798,p<.01). Younger-[s] ChMC children incorrectly associated *uno de los* to the interpretation of 'more than one' more often than older-[s] ChMC children.

Finally, Table 37 shows the percentage of children who had systematic responses in the *uno de los* condition.

Table 37. Study 1: *Uno de los*: Systematic Responders.

| | Systematic Plural Response (3-4 plural) | Systematic Singular Response (3-4 singular) | Systematic Total | Variable Plural Response (2 pl/ 2 sg) |
|---|---|---|---|---|
| **Plural Pronounced as [s]** | | | | |
| **Younger** | | | | |
| **MexWC** | 0% | 93% | 93% | 7% |
| **ChMC** | 20% | 47% | 67% | 33% |
| **ChWC** | 0% | 87% | 87% | 13% |
| **Older** | | | | |
| **MexWC** | 0% | 100% | 100% | 0% |
| **ChMC** | 10% | 90% | 90% | 10% |
| **ChWC** | 0% | 100% | 100% | 0% |
| **Plural Pronounced as [h]** | | | | |
| **ChMC** | 0% | 89% | 89% | 11% |
| **ChWC** | 18% | 73% | 91% | 9% |

There were several younger-[s] ChMC children who were variable in their interpretation of *uno de los* ('one.SG of the.PL'). The variable responders in the younger-[s] group were: 1 MexWC, 5 ChMC, and 2 ChWC. In the older-[s] group only 1 ChMC child had a variable response pattern. In the younger-[h] group only 1 ChMC and 1 ChWC child had a variable response pattern. It is surprising that Chilean children would be variable in

their interpretation of *uno de los* given that the same children systematically treated *un/una* ('a/one') as singular and had a tendency to incorrectly treat the plural *unos* ('some.pl') as singular. At this point, I am not sure why we found more variable responders in this condition. In any case, the majority of children tended to treat *uno de los* as singular. It may be that some children are sometimes focusing on *uno* ('one.SG') and sometimes focusing on *los* ('the.PL') in their interpretation and ignoring the rest.

### 5.1.6 Highlighting Task

Of the younger children the Highlighting Task was administered to 9 ChWC, 4 ChMC and 3 MexWC children. None of the 9 ChWC children improved. All of the ChMC children and one of the MexWC children improved. Of the older children the Highlighting Task was administered to 2 ChWC, 1 ChMC and no MexWC children. The ChWC children did not improve; the ChMC child did improve. The number of children administered the Highlighting Task and who treated the plural indefinite as plural are shown in Table 38.

Table 38. Study 1: Highlighting Task: Plural Responses.

|         | ChWC      | ChMC       | MexWC     |
|---------|-----------|------------|-----------|
| **Younger** | 0/9 (0%)  | 4/4 (100%) | 1/3 (33%) |
| **Older**   | 0/2 (0%)  | 1/1 (100%) | N/A       |

## 5.1.7 Feminine vs. Masculine Nouns

Given that the plural and singular feminine indefinites differ only by the presence or absence of the plural morpheme (*unas* vs. *una*) while the form of the masculine plural indefinite is also different from that of masculine singular indefinites (*unos* vs. *un*), it is possible that children would be better at interpreting number on masculine indefinites than on feminine indefinites because there would still be a difference between the singular and plural forms even if syllable final /s/ were omitted (*un auto* 'a/one.SG car.SG' vs. *uno[∅] auto[∅]* 'some.PL cars.PL']. However, this difference between masculine and feminine indefinites would not be relevant for the partitive constructions *uno de los* and *algunos de los*, given that the only difference between the singular and plural forms of *algunos de los* is the plural morpheme /s/ (*alguno de los* vs. *algunos de los*) and the plural form of *uno de los* does not exist in adult Spanish (*\*unos de los*). For the younger-[s] ChWC children paired sample t-tests showed that for there were no significant differences in plural responses between masculine vs. feminine indefinites in any condition: *unos* vs. *unas* (t (1,13) =-1.472, p = .165), *algunos* vs. *algunas* (t (1,13) = 1.883, p = .082), *uno de los* vs. *una de las* (t (1,13) = -.366, p = .720), and *algunos de los* vs. *algunas de las* (t (1,13) = 1.883, p = .082). For the younger-[s] ChMC children paired sample t-tests also showed no significant differences between masculine and feminine indefinites in any condition: *unos* vs. *unas* (t (1,13) =.366, p = .720), *algunos* vs. *algunas* (t (1,13) = 1,147, p = .272), *uno de los* vs. *una de las* (t (1,13) = .366, p = .720), and *algunos de los* vs. *algunas de las* (t (1,13) = 1.472, p = .165). For younger-[s] Mexican working class children there were no significant differences between masculine and feminine noun phrases on *unos* vs. *unas* (t(1,13)=.434,p=.671), *algunos* vs. *algunas*

(t(1,13)=.000,p=1.0), *uno de los* vs. *una de las* (t(1,13)=.000,p=1.0), *algunos de los* vs.

*algunas de las* (t(1,13)=-.562,p=.583). There were also no significant differences for

older-[s] ChWC between feminine and masculine nouns *unos* vs. *unas* (identical data

sets), *algunos* vs. *algunas* (t(1,9)=-1.0,p=.343), *uno de los* vs. *una de las* (t(1,9)=-

.557,p=.591), *algunos de los* vs. *algunas de las* (identical data sets) or for older-[s]

ChMC children *unos* vs. *unas* (identical data sets), *algunos* vs. *algunas* (identical data

sets), *uno de los* vs. *una de las* (t(1,9)=1.0,p=.343), *algunos de los* vs. *algunas de las*

(t(1,9)=-.429,p=.678) or for older-[s] MexWC children *unos* vs. *unas* (t(1,4)=-

1.0,p=.374), *algunos* vs. *algunas* (t(1,4)=-1.0,p=.374), *uno de los* vs. *una de las*

(t(1,4)=1.633,p=.178), *algunos de los* vs. *algunas de las* (t(1,4)=-1.633,p=.178). Finally,

even when the plural morpheme was pronounced as [h] there were no significant

differences between masculine and feminine nouns for the ChWC on *unos* vs. *unas*

(t(1,10)=1.491,p=.167), *algunos* vs. *algunas* (t(1,10)=1.491,p=.167), *uno de los* vs. *una*

*de las* (identical data sets), *algunos de los* vs. *algunas de las* (t(1,10)=.559,p=.588) nor

for the ChMC children on *unos* vs. *unas* (t(1,8)=1.000,p=.347), *algunos* vs. *algunas*

(t(1,8)=1.000,p=.347), *uno de los* vs. *una de las* (t(1,8)=-1.000,p=.347), *algunos de los*

vs. *algunas de las* (t(1,8)=-2.000,p=.081). Table 39 shows the percentage of plural

responses in the feminine and masculine noun conditions.

184

Table 39. Study 1: Plural Responses in Feminine and Masculine Trials.

| COND | Younger Children [s] | | | Older Children [s] | | | Younger Children [h] | |
|---|---|---|---|---|---|---|---|---|
| | CWC | CMC | MWC | CWC | CMC | MWC | CWC | CMC |
| **unos** | 33% (10/30) | 67% (20/30) | 79% (22/28) | 75% (15/20) | 90% (18/20) | 90% (9/10) | 27% (6/22) | 33% (6/18) |
| **unas** | 30% (9/30) | 63% (19/30) | 75% (21/28) | 75% (15/20) | 90% (18/20) | 100% (10/10) | 18% (4/22) | 28% (5/18) |
| **algunos** | 33% (10/30) | 93% (28/30) | 79% (22/28) | 75% (15/20) | 90% (18/20) | 100% (10/10) | 41% (9/22) | 56% (10/18) |
| **algunas** | 43% (13/30) | 83% (25/30) | 75% (21/28) | 80% (16/20) | 90% (18/20) | 100% (10/10) | 32% (7/22) | 50% (9/18) |
| **uno de los** | 10% (3/30) | 40% (12/30) | 14% (4/28) | 5% (1/20) | 0% (0/20) | 20% (2/10) | 23% (5/22) | 6% (1/18) |
| **una de las** | 10% (3/30) | 37% (11/30) | 14% (4/28) | 10% (2/20) | 0% (0/20) | 0% (0/10) | 23% (5/22) | 6% (1/18) |
| **alg de los** | 40% (12/30) | 90% (27/30) | 50% (14/28) | 70% (14/20) | 85% (17/20) | 80% (80/10) | 41% (9/22) | 17% (3/18) |
| **alg de las** | 30% (9/30) | 83% (25/30) | 54% (15/28) | 70% (14/20) | 90% (18/20) | 100% (10/10) | 36% (8/22) | 33% (6/18) |

## 5.1.8 Discussion

I will first discuss the results of each experimental group separately: (1) younger children with plural pronounced as [s], (2) older children with plural pronounced as [s], and (3) younger children with plural pronounced as [h] and then discuss differences between the three groups.

The results for the younger-[s] groups revealed that only Mexican children were able to reach adult levels in the *unos* condition, while both ChMC and MexWC children

performed at adult levels in the *algunos* condition. In the *algunos de los* condition, only

ChMC children reached adult levels. However, in any experimental task there are several

reasons for why younger children perform differently from adults (e.g. attention,

memory, task difficulty). Given that Mexican and Chilean children were of the same age,

had similar educational and economic backgrounds and were administered identical tests

and given the differences in the production of the plural morpheme in the input to each of

the three child groups, I assume that any differences found between the three groups is

associated primarily with the linguistic input that children are exposed to.

With respect to the plural indefinites, I assume that, if Spanish-speaking children

have an underlying representation for the plural morpheme, they should associate the

plural indefinites to the interpretation of 'more than one'. The results show that for

younger-[s] children, most MexWC children (12/14) associate *unos* to the interpretation

of 'more than one', while less ChMC children (8/15) and even fewer ChWC children

(4/15) do. On the other hand, most ChMC children (14/15) and MexWC children (11/14)

associate *algunos* with 'more than one' while very few ChWC children (5/15) do. At this

point, these findings suggest that there is a strong tendency by Chilean children in general

to treat the indefinite *unos* as associated to and interpretation of 'one'. I suggest that this

is due to the fact that the plural indefinite *unos/unas* is almost identical in form to the

Spanish numeral for 'one' (*uno/una*). If Chilean children have not matched [s] or [h] to

an underlying representation for number, then the plural indefinite becomes identical to

the numeral 'one'. The presence of word final [s] or [h] on *unas/unos* has no extra

meaning associated with it, in the same way that the final non-morphological [s] or [h] on

*lapiz* ('pencil') does not change the meaning of the word (e.g. [lapis], [lapih], [lapi] =

'pencil'). Given that Chilean children perform well on the controls (quantifiers and numerals) and tend to treat both the singular and plural forms of *un/una* as singular, I suggest that they have initially constructed a grammar that relies on lexical items (quantifiers and numerals) to assign number.

However, the results also showed that all ChMC children associated the plural indefinite *unos/unas* to the interpretation of 'more than one' when the plural morpheme was highlighted. This indicates that the ChMC children, but not ChWC children, are constructing a grammar, which matches [s] and [h] to an underlying representation for number, yet still relies on lexical items (quantifiers and numerals) to assign number. As a result, it seems that ChMC children have two phonological forms that are competing in the interpretation they assign to the indefinite plural: uno = 'one' vs. [s]/[h] = 'more than one'.

An unexpected finding for the younger-[s] group was that, while most ChMC children (13/15) associated the overt plural partitive *algunos de los* with 'more than one', only half of the MexWC children (6/14) and very few ChWC children (5/15) did. Both the plural *algunos de los* ('some.PL of the.PL') and the singular *alguno de los* ('one.SG of the.PL') are grammatical in adult Spanish, although the latter is not felicitous in this context. It is unclear why Mexican children had difficulty with the plural overt partitive given that the same children associated *unos* ('some.PL') and *algunos* ('some.PL') to 'more than one'. However, because MexWC children are exposed to an input that systematically marks the plural and yet many MexWC children did not associate the plural *algunos de los* to an interpretation of 'more than one', it is difficult to interpret the results for the Chilean children. It was suggested that Mexican children may have found

that given the experimental context of only 6 items to choose from (e.g. 6 miniature spiders) a singular response was sufficient. Based on the data I collected, I will not be able explain why Mexican children had difficulty in this condition and will instead leave it to future research.

Another unexpected finding was in the *uno de los* ('one.SG of the.PL') condition. Ferenz and Prasada (2002) showed that by 2;0 years of age English-speaking children associate singular partitive constructions, like 'one of the marbles', to an interpretation of 'one'. However, the results presented here for Spanish-speaking children revealed that while most of the younger-[s] MexWC children (13/14) and ChWC children (13/15) associated the singular overt partitive to 'one', several ChMC children (7/15) associated it to a 'more than one' interpretation. The findings for ChMC children are especially surprising given the fact that these same ChMC children associated the indefinite singular *un/una* to an interpretation of 'one'. At this point, the behavior of the ChMC children is unclear. This may be a case of hypercorrection. Given the presence of the plural morpheme on the definite determiner in the partitive construction along with the fact that the plural morpheme is often omitted in Chilean Spanish, ChMC children may have interpreted *uno de los/una de las* as *unos de los/unas de las*. While the latter plural form is ungrammatical in Spanish, Chilean children would not necessarily know this if the plural is sometimes omitted in the input they are exposed to. The finding that MexWC children (exposed to systematic plural marking) performed well in this condition indicates that the behavior of the ChMC children may be associated to the variable nature of the input to which they are exposed.

The plural morpheme is also pronounced as [h] some of the time in adult Chilean speech. It is possible that Chilean children encode [h] as the plural morpheme instead of [s]. However, the findings of Study 1 do not to support this idea. Both ChWC and ChMC children incorrectly associate all three plural indefinites to the interpretation of 'one' more often when the plural morpheme is pronounced as [h], suggesting that they have not encoded [h] as the plural morpheme.

One interesting finding for the Chilean children who did associate [h] to 'more than one' was that these children would often correct the researcher's aspirated pronunciation of the plural morpheme. In other words, when the researcher read the experimental sentence with aspiration, "*Pon unah bolitah en la caja*" ("Put some.PL marbles.PL in the box"), ChMC children would often repeat the sentence back to the researcher, as if correcting him, with [s] as the plural morpheme instead of [h], "*Pon unas bolitas en la caja*". This suggests that these ChMC children associate [h] to 'more than one' but preferred the [s] pronunciation over the [h] pronunciation in the experimental context.

Up until this point, I have only discussed the results of the younger children. However, the results for the older children show that all older child groups perform at adult levels in Study 1. This indicates that while MexWC children associate the plural morpheme with 'more than one' by 4;7 years of age, ChWC children do not associate the plural morpheme with 'more than one' until about 6;7 years of age, two years later. Moreover, ChMC children hypercorrect on *uno de los* until approximately 6;0 years of age. It important to note that not only are the Chilean children much older than the Mexican children, but they also receive reading and writing instruction in school while

the Mexican children do not. In addition, two ChWC children (child 1: 6;10, child 2: 8;0) still associated all three plural conditions (but not plural control conditions) with 'one' and did not improve in the Highlighting Task. This suggests that even at this age, some Chilean children still have not encoded the plural morpheme. However, we must be careful in our interpretation of the results as we did not test the older children on the plural morpheme pronounced as [h].

Given that the experiment in Study 1 was administered to MexWC, ChMC and ChWC children using the same methods and materials, it is quite interesting to see such differences in child behavior across the three groups. A study that would have examined only Chilean or only Mexican children would not have provided an adequate account of plural morpheme acquisition in Spanish-speaking children in general, especially since several dialects of Spanish have syllable final /s/ lenition.

The findings from Study 1 support the Variability Delay Hypothesis, which hypothesizes that variability in the input will delay child comprehension of grammatical forms when the variability causes an ambiguity (involves omission) and is constrained not only by linguistic (phonological, grammatical) but also extra-linguistic (SES, age, sex) factors. MexWC children, who are exposed to systematic plural marking, differ from ChWC and ChMC children, who are exposed to variable plural marking involving omission. This indicates that the development of plural morphology in the presence of systematic vs. variable input is not the same.

5.1.9   Summary of Findings

The following is a summary of the results for the comprehension of plural morphology in Study 1.

1. Chilean children differ from Mexican children in their comprehension of the plural morpheme in indefinite noun phrases.

2. When the plural morpheme is systematically produced in the adult speech, Mexican Spanish-speaking children associate the plural morpheme to an interpretation of 'more than one' by at least 4;7 years of age.

3. When the plural morpheme has a variable behavior and is also omitted in the adult speech, ChWC children do not associate the plural morpheme in indefinite noun phrases to an interpretation of 'more than one' until approximately 6;7 years of age.

4. The ChMC children appear to have difficulty associating the plural indefinite *unos* to an interpretation of 'more than one', unless presented with the highlighting task, suggesting, along with the findings for *uno de los* (one.SG of the.PL), that ChMC children are beginning to associate the plural morpheme [s] with the interpretation of 'more than one' by approximately 4;8 years of age but they still rely on other information (e.g. quantifiers, numerals) to assign number to the noun phrase.

5. Almost all Chilean and Mexican children were systematic in their interpretation of the plural and singular noun phrases.

6. The younger ChWC and ChMC children have difficulty associating both [s] and [h] to an interpretation of 'more than one', with [h] resulting in more interpretations of 'one' than [s].

7. The difference in form between the plural and singular masculine determiners does not result in more correct responses in the masculine targets than on the feminine targets.

## 5.2 Study 2. Picture Matching Task: Indefinite Noun Phrases

Study 1 showed that both ChWC children and ChMC children, but not MexWC children, associate the plural indefinite *unos* to an interpretation of 'one' in an Act-out Task. The purpose of Study 2 is to test child comprehension of *unos* using a different experimental methodology (Picture Matching Task) in order to confirm the findings of Study 1. Moreover, unlike Study 1, I will test the same children on their comprehension of both [s] and [h] in Study 2. The purpose of testing the same children on both variants is to determine whether Chilean children, who do not associate the plural variant [s] to 'more than one', will associate the plural variant [h].

### 5.2.1 Background

Study 2 examines child comprehension of the singular and plural indefinites, as in (6).


(6)    a.    ¿En cuál de las dos tarjetas hay <u>una    botella</u>?

            In which of the two cards    EXST    a/one.SG bottle.SG

            'In which of the two cards is there a/one bottle?'


        b.    ¿En cuál de las dos tarjetas hay <u>unas    botellas</u>?

            In which of the two cards    EXST some.PL bottles.PL

            'In which of the two cards are there some bottles?'


The indefinite in (6a) is singular and the indefinite in (6b) is plural. The existential verb *hay* ('there is/there are') was used because it does not carry number information. It can be

used with both plural and singular nouns. For this reason, the only number information in (6a) and (6b) is the plural morpheme in the determiner phrase.
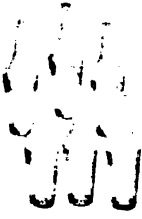
Study 2 asks the following questions: (1) Given the differences in the input, will Chilean children differ from Mexican children in their comprehension of indefinite plural noun phrases, as they did in Study 1? (2) Will Chilean children with variable input associate the plural morpheme to an interpretation of 'more than one'? (3) Will the same Chilean children treat both [s] and [h] as associated to an interpretation of 'more than one'. (4) Given that the masculine plural noun phrase has a different form than the singular masculine noun phrase (e.g. *un auto* vs. *unos autos*), will children perform better on masculine noun phrases than on feminine noun phrases?

## 5.2.2   Method and Design

A Picture Matching task was used. Subjects were presented with pairs of pictures (Figure 10) where one picture card had a singular object and the other card had 6 objects of the same kind. Children were asked questions like (7) and (8) in the context of Figure 10 and answered the question by pointing to the appropriate picture. See Appendix B for full set of materials. Each child was tested on both the plural and singular indefinites and for each pair of picture cards, they were only asked a question with either a plural indefinite noun phrase or a singular indefinite noun phrase. The plural morpheme was always pronounced as [s]. Chilean children who consistently chose the singular card in the plural condition were tested a week later with the plural morpheme pronounced as [h]. There were 4 trials of the plural condition, four 4 of the singular condition, and 4 fillers from another experiment testing child comprehension of the Spanish copulas *ser* and *estar*. In the 8 target trials the initial sound and the gender of each target word was

193

controlled for Chilean subjects: *burros* 'donkeys', *monos* 'monkeys', *barcos* 'boats', *martillos* 'hammers', *bolitas* 'marbles', *manzanas* 'apples', *botellas* 'bottles', *monedas* 'coins' (see Study 1 for a discussion of how initial sounds were controlled for). The same words were used for Mexican children except *changos* was used for 'monkeys' and *canicas* was used for 'marbles' so that we could continue to use the same materials yet accommodate to the Mexican Spanish lexicon. In addition, half of the indefinites were feminine and half were masculine. In the feminine indefinites, only the plural morpheme provides number information. In masculine indefinites the form of the determiner is also different in the singular vs. plural conditions.

Figure 10. Study 2: Sample Target Trial.



(7) ¿En cuál de las dos tarjetas hay una botella?

In which of the two cards EXST a/one.SG bottle.SG?

'In which of the two cards is there a/one bottle?'

(8) ¿En cuál de las dos tarjetas hay unas botellas?

In which of the two cards EXST some.PL bottle.PL?

'In which of the two cards are there some bottles?'

## 5.2.3 Subjects

50 children participated in this study: 19 MexWC (4;11-6;2, Mean: 5;4), 17 ChWC (4;9-6;4, Mean: 5;5), 10 ChMC (4;10-6;4, Mean: 5;5) children. In addition, 22

194

Chilean adults and 8 Mexican adults participated in this study. Table 40 shows the distribution of the child subjects.

Table 40. Study 2: Distribution of Children.

|  | Pronunciation | Number | Age Range | Mean Age |
|---|---|---|---|---|
| **MexWC** | [s] | 19 | 4;11-6;2 | 5;4 |
| **ChMC** | [s]/[h] | 10 | 4;10-6;4 | 5;5 |
| **ChWC** | [s]/[h] | 17 | 4;9-6;4 | 5;5 |

The Chilean children were recruited from schools in Punta Arenas, Chile and the Mexican children from a daycare in Mexico City. All children were in preschool and kindergarten. Chilean adults were undergraduates at the Universidad de Magallanes in Punta Arenas, Chile and the Mexican adults were undergraduates at the Universidad Autónoma Metropolitana de Iztapalapa in Mexico City.

### 5.2.4 Procedure

All subjects were tested by native speakers of Spanish who lived in the same city as the subjects. The author of this dissertation was present during the testing of all subjects to ensure that procedures were identical for all subjects. Because of the simplicity of the task, there was no warm-up and only two controls (one control involved *un solo* 'only one' and the other *muchos* 'many') that were administered after children finished all target questions. The controls were administered after the target questions so that *un solo* 'only one' would not provide any information to the child about the

195

interpretation of *un* 'a/one'. In addition, placement of cards (singular card above plural card vs. plural card above singular card) was controlled for. Half of the children from each group was presented with the singular card above the plural card and the other half was presented with the plural card above the singular card. The order of presentation of sentences was the same for all subjects. Children who consistently chose the singular picture card in the plural condition were tested between 1 – 2 weeks later by a different researcher who pronounced the plural morpheme as [h].

5.2.5   Results

There were no differences between Chilean and Mexican adults (all adults performed correctly 100% of the time) so their scores were combined. Choosing the card with multiple items was considered a plural response. Choosing the card with only one item was considered a singular response. All children treated the controls *un solo* ('only one') as associated to the interpretation of 'one' and *muchos* ('many.pl') as associated to the interpretation of 'more than one' 100% of the time. Although all children performed well on controls, they did not all perform the same in the target conditions. Table 41 shows the percentage of plural responses when the plural morpheme was pronounced as [s] for adults, MexWC children, ChMC children, and ChWC children.

Table 41. Study 2: Plural Responses in Target Conditions.

| | *unos* ('some.PL') | *un* ('a/one.SG') |
|---|---|---|
| **Adults** | 100% | 0% |
| **MexWC** | 79% | 6% |
| | (60/76) | (4/76) |
| **ChMC** | 33% | 0% |
| | (12/40) | (0/40) |
| **ChWC** | 35% | 1% |
| | (24/68) | (1/68) |

Adults performed at ceiling on both the plural and singular indefinites and children performed at ceiling on the singular indefinite condition *un* ('a/one.SG'). However, in the plural indefinite condition while MexWC children associated the plural indefinite to an interpretation of 'more than one', the ChMC children and ChWC children associated the plural indefinite to an interpretation of 'one', choosing the picture with only one item in the plural condition.

Within every group there were children who treated the plural indefinite *unos* ('some.PL') as meaning 'more than one'; however, the groups differed significantly in how many children did this. The number of plural responses in the plural indefinite *unos* condition for each child was entered into a one-way ANOVA (adults, MexWC, ChMC, ChWC). The results showed a significant difference between the four groups $(F(3,74)=20.210, p<.001)$. Post hoc Bonferroni tests showed that only ChMC $(p<.001)$

and ChWC (p<.001), but not MexWC (p=.092), children differed significantly from adults in the number of plural responses assigned to the plural indefinite. MexWC children also differed significantly from ChWC (p<.05) and ChMC (p<.05) children but there were no significant differences between the two Chilean child groups (p=1.0).

Table 42 and Table 43 show the percentage of children who were systematic in their responses. Systematic responders are categorized as those who chose either the singular or plural picture in at least 3 out of 4 trials. Variable responders are children who chose the plural picture in half of the trials (2 out of 4) and the singular picture in half of the trials.

Table 42. Study 2: *Unos*: Systematic Responders.

| | Systematic Plural Response (3-4 plural) | Systematic Singular Response (3-4 singular) | Systematic Total | Variable Plural Response (2 pl/ 2sg) |
|---|---|---|---|---|
| | **Plural Pronounced as [s]** | | | |
| **MexWC** | 74% | 21% | 95% | 5% |
| **ChMC** | 20% | 70% | 90% | 10% |
| **ChWC** | 35% | 65% | 100% | 0% |

Table 43. Study 2: *Un*: Systematic Responders.

| | Systematic Plural Response (3-4 plural) | Systematic Singular Response (3-4 singular) | Systematic Total | Variable Plural Response (2 pl/ 2sg) |
|---|---|---|---|---|
| **Plural Pronounced as [s]** | | | | |
| **MexWC** | 11% | 89% | 100% | 0% |
| **ChMC** | 0% | 100% | 100% | 0% |
| **ChWC** | 0% | 100% | 100% | 0% |

Similar to Study 1, almost all of the children were systematic in their responses. The children who treated the plural indefinite as associated to 'one' did so systematically. In other words, it is not the case that the there were children who associated the plural indefinite to 'one' in half of the trials and also to 'more than one' in half of the trials. Instead, children either associated the plural indefinite to 'one' systematically or they associated it to 'more than one' systematically.

Between 1 – 2 weeks after this experiment was carried out with the plural morpheme pronounced as [s], Chilean children who chose the singular card in at least three of the four *plural* trials were administered the same experiment but this time the plural morpheme was pronounced as [h]. 11 ChWC children and 7 ChMC children participated in this part of the experiment. The behavior of all children did not change. The 11 ChWC children continued to choose the singular card in the plural condition 95% of the time and the 8 ChMC did so 97% of the time. Paired samples t-test showed that

there was no significant improvement neither for the 11 ChWC children (t(1,10)=-1.00,p=.343) nor the 7 ChMC children (t(1,8)=-.552,p=.598).

5.2.6   Feminine vs. Masculine Nouns

It was suggested in Study 1 that children may perform better on the masculine targets than on the feminine targets given that the only difference between the singular and plural feminine indefinites (*unas* 'some.PL' vs. *una* 'a/one') is the presence of the plural morpheme while the form of the plural masculine indefinite (*unos* 'some.PL') and singular masculine indefinite (*un* 'a/one') is different. However, the results of Study 1 showed that the gender of the indefinite noun phrase did not affect children's performance. It appears that gender did not affect child performance in Study 2 either. The percentage of plural responses on the feminine and masculine indefinite plurals is shown in Table 44.

Table 44. Study 2: Plural Responses in Feminine and Masculine Trials.

|  | ChWC | ChMC | MexWC |
| --- | --- | --- | --- |
| **unos ('some.M.PL')** | 38% | 30% | 74% |
|  | (13/34) | (6/20) | (28/38) |
| **unas ('some.F.PL')** | 32% | 30% | 84% |
|  | (11/34) | (6/20) | (32/38) |

Paired samples t-tests showed that there were no significant differences in the number of plural responses between plural masculine and plural feminine indefinite noun phrases for ChWC children (t(1,16)=-1.852,p=.083), for ChMC children (t(1,9)=-1.0,p=.343), nor

200

for MexWC children ($t(1,18)=1.455, p=.163$). Similar to Study 1, the gender of the noun does not affect child performance in Study 2.

### 5.2.7 Discussion

The experimental task in Study 2 seemed to be a bit more difficult for all three child groups than the experimental task in Study 1, as the number of plural responses across the three child groups was slightly lower in the plural indefinite condition in Study 2. It is possible that deciding between two pictures that contain the same objects, only differing in the quantity of the objects, may cause difficulty for children if they are focusing on the presence or absence of the object itself and not on the quantity. In other words, given the question, "Which card has some marbles", children may be happy to choose any card that has marbles, regardless of quantity. However, if this is the case, it is unclear why the results did not show variable responders in the plural indefinite condition. Instead, Chilean and Mexican children systematically chose either the singular or plural card in the plural indefinite condition. If children were not paying attention to quantity information, we might expect them to guess (because both cards would be possible), which would result in more variable responders.

Although the task appears to have been slightly more difficult for all three child groups, the results still show that, given the same experimental conditions, the Mexican children still associate the plural indefinite to an interpretation of 'more than one' much more often than the Chilean children, regardless of whether the plural is pronounced as [s] or [h] for the Chilean children, which suggests that several Chilean children matched neither [s] nor [h] to an underlying representation for number. Because we did not administer a highlighting task in this study, we do not know for sure whether Chilean

201

children would improve if the plural morpheme were highlighted for them. Nevertheless, the findings of Study 2 suggest very strongly that the variable input, which Chilean children are exposed to, delays their comprehension of the plural morpheme, providing support for the Variability Delay Hypothesis.

Finally, similar to Study 1, the results of Study 2 show that gender had no effect on children's ability to associate the plural indefinite to an interpretation of 'more than one'. Children performed the same in the masculine and feminine trials.

## 5.2.8   Summary of Findings

The following is a summary of the results for the comprehension of plural morphology in Study 2.

1. Chilean children differ from Mexican children in their comprehension of the plural morpheme.

2. When the plural morpheme is systematically produced in the adult speech, Mexican Spanish-speaking children associate the plural morpheme to an interpretation of 'more than one' by 5;4 years of age.

3. When the plural morpheme has a variable behavior and is also omitted in the adult speech and no Highlighting Task is provided, ChWC and ChMC children do not associate the plural indefinite *unos* to an interpretation of 'more than one' at even at 5;5 years of age.

4. Almost all Chilean and Mexican children were systematic in their interpretation of the plural and singular indefinite noun phrases.

5. ChWC and ChMC children have difficulty associating both [s] and [h] in the plural indefinite *unos* to an interpretation of 'more than one'.

6. The difference in form between the plural and singular masculine determiners does not result in more correct responses in the masculine targets than on the feminine targets.

7. The findings from Study 2 are consistent with the findings from Study 1.

## 5.3   Study 3. Picture Matching Task: Indefinite Noun Phrases

The results of Study 2 showed that overall all three child groups provided slightly fewer plural responses (i.e. choosing the picture with more than one object) than in Study 1. I suggested that this might possibly be due to the experimental materials in that children had to decide between two pictures that contained the same objects. It may have been the case that children were paying attention to the presence or absence of the object and not to quantity in itself. The goal of Study 3 is to test child comprehension of the plural indefinite *unos* in a context where there are other objects in the picture to see whether the percentage of plural responses (i.e. choosing the picture with multiple objects) will increase for all child groups and also to test whether significant differences will still be found between Mexican and Chilean children.

### 5.3.1   Background

Study 3 investigates Chilean and Mexican children's interpretation of plural and singular indefinite noun phrases as in (9).


(9)      a.      ¿Cuál  niño tiene <u>unos     burros</u>?

          Which boy  has   some.PL donkeys.PL

          'Which boy has some donkeys?'

203

b.　　¿Cuál niño tiene <u>un</u>　　<u>burro</u>?

Which boy has　a/one.SG donkey.SG

'Which boy has a/one donkey?'

The indefinite in (9a) is plural and the indefinite in (9b) is singular. Both the plural and singular indefinites are in object position and the verb does not agree with the indefinite in number. For this reason, in the feminine determiner phrases the only number information is the presence or absence of the plural morpheme on the noun and determiner. The form of the masculine determiners is different in the plural vs. singular determiner phrases.

Study 3 asks the following questions: (1) Given the differences in the input, will Chilean children differ from Mexican children in their comprehension of indefinite plural noun phrases, as they did in Study 1 and Study 2? (2) Will there be an increase in plural responses for all three child groups in Study 3 as compared to Study 2? (3) Will the Chilean children treat both [s] and [h] as associated to an interpretation of 'more than one'. (4) Given that the masculine plural noun phrase has a different form than the singular masculine noun phrase (e.g. *un auto* vs. *unos autos*), will children perform better on masculine noun phrases than on feminine noun phrases?

5.3.2　Method and Design

A Picture Matching Task was used. Subjects were presented four short narratives (Figure 11) about a group of children who were taking a trip together. See Appendix C for the full set of narratives and pictures. After each short narrative, children were asked questions like (9a) and (9b) above. For each short narrative, subjects were asked two

204

questions with either plural indefinites *unos/unas* 'some.M.PL/some.F.PL' or singular

indefinites *un/una* 'a/one.M.PL/a/one.F.PL' (as shown in Figure 11). The middle question,

*¿Cuál niño no tiene nada?* ('Which boy has nothing?'), was used to draw children's

attention back to the center of the picture.

Figure 11. Study 3: Sample Target Trial.
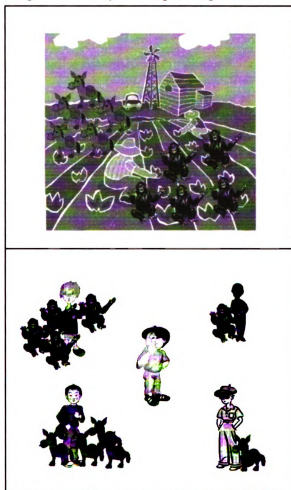
Researcher: *"Primero los niños fueron a mirar a los animales que había en el campo. Había _____ y _____. Así es que los niños jugaron con los animales. A ver, veamos que tiene cada niño."* "First the boys went to see the animals that were in the countryside. There were _____ y _____. So the boys played with the animals. Let's see what each boy has."

(10)  a.  *¿Cuál niño tiene unos    monos?*

Which boy has   some.PL monkey.PL

'Which boy has some monkeys?'


b.  *¿Cuál niño no   tiene nada?*

Which boy NEG has   nothing

'Which boy doesn't have anything?'


c.  *¿Cuál niño tiene unos    burros?*

Which boy has   some.PL donkey.PL

'Which boy has some donkeys?'


The boy with multiple objects is the correct answer in the plural condition and the boy holding only one object is the correct answer in the singular condition. There were 4 singular target sentences, 4 plural target sentences, 4 singular controls, 4 plural controls

and 10 fillers from a study on the development of the Spanish copulas *ser* and *estar* in children.

In the target sentences the initial sound and the gender of each direct object was controlled for Chilean subjects: *burros* 'donkeys', *monos* 'monkeys', *barcos* 'boats', *martillos* 'hammers', *bolitas* 'marbles', *manzanas* 'monkeys', *botellas* 'bottles', *monedas* 'coins' (see above for explanation of how initial sounds were controlled for). Again, the same words were used for Mexican children except *changos* was used for 'monkeys' and *canicas* was used for 'marbles'. In addition, half of the indefinites were feminine and half were masculine. In the feminine indefinites, only the plural morpheme provides number information. In masculine indefinites the form of the determiner is also different in the singular vs. plural conditions. Controls involved *muchos* ('many') and *un solo* ('only one'). In the control condition only gender, but not initial sound, was controlled for. Subjects could perform well on the controls even if they ignored the plural morpheme (*¿Cuál niña tiene una sola llave?* 'Which girl has only one key?').

### 5.3.3   Subjects

52 children participated in this study. 12 MexWC (4;7-5;7, Mean: 5;1), 10 ChWC (5;1-5;6, Mean: 5;3), 10 ChMC (5;0-5;4, Mean: 5;2) children and 20 adults (10 Chilean and 10 Mexican) participated in the version of the study where the researcher pronounced the plural morpheme as [s]. In addition, 11 ChWC (4;6 – 5;11, Mean: 5;1) and 9 ChMC children (4;6 – 6;1, Mean: 5;5) participated in the study where the researcher pronounced the plural morpheme as [h]. Chilean children attended preschools and kindergartens in Punta Arenas, Chile and the Mexican children attended a preschool in Mexico, D.F. None of the children had yet received any reading education at school. Chilean adults were

undergraduates at the Universidad de Magallanes in Punta Arenas, Chile and the Mexican

adults were undergraduates at the Universidad Autónoma Metropolitana de Iztapalapa in

Mexico, D.F. Table 45 shows the distribution of children.

Table 45. Study 3: Distribution of Children.

|  | Pronunciation | Number | Age Range | Mean Age |
|---|---|---|---|---|
| **MexWC** | [s] | 12 | 4;7-5;7 | 5;1 |
| **ChMC** | [s] | 10 | 5;0-5;4 | 5;2 |
|  | [h] | 9 | 4;6-6;1 | 5;5 |
| **ChWC** | [s] | 10 | 5;1-5;6 | 5;3 |
|  | [h] | 11 | 4;6-5;11 | 5;1 |

## 5.3.4 Procedure

All subjects were tested by native speakers of Spanish who lived in the same city

as the subjects. The author of this dissertation was present during the testing of all

children to ensure that procedures were identical for all subjects. The experimenter

started the testing session by introducing the main characters in the story to the child. The

experimenter then presented each section of the story to the child, stopping after each

short narrative to ask the target questions. All 8 target sentences were presented first,

followed by 10 fillers and then 8 controls. Controls were presented last to ensure that *un*

*solo* ('only one') would not provide number information for *un* ('a/one.SG') and that

children would not be biased to pick the singular picture in the *unos* ('some.PL')

208

condition because they assumed that *muchos* ('many.PL') and *unos* ('some.PL') could not refer to the same quantity, that *unos* ('some.PL') must be less. Materials and presentation of materials was identical for all children. Mexican adults were tested in the same way as children while Chilean adults were given a paper and pencil version of this task.

## 5.3.5   Results

There were no differences between Chilean and Mexican adults so their scores were combined. Although all children performed well on controls, they did not all perform the same in the target conditions. The dependent variable is the number of plural responses. Choosing the character with multiple items was considered a plural response. Choosing the character with only one item was considered a singular response. Table 46 shows the percentage of plural responses for adults, MexWC children, ChMC children, and ChWC children when the plural was pronounced as [s] and [h].

Table 46. Study 3: Plural Responses in Target Conditions.

*unos* ('some.PL')       *un* ('a/one.SG')

**Plural Morpheme Pronounced as [s]**

| | | |
|---|---|---|
| **Adults** | 100% | 0% |
| **MexWC** | 88% | 8% |
| | (42/48) | (4/48) |
| **ChMC** | 60% | 4% |
| | (24/40) | (1/40) |
| **ChWC** | 25% | 23% |
| | (10/40) | (9/40) |

**Plural Morpheme Pronounced as [h]**

| | | |
|---|---|---|
| **ChMC** | 78% | 8% |
| | (28/36) | (3/36) |
| **ChWC** | 59% | 21% |
| | (26/44) | (9/44) |

Within every group there were children who associated the plural indefinite *unos* 'some.PL' to an interpretation of 'more than one'; however, the groups differed significantly in how many children did so. Looking first at the children who heard the plural morpheme pronounced as [s] in the experiment, the number of plural responses for each child was entered into a 4 (Group: adults, [s]-MexWC, [s]-ChMC, [s]-ChWC) X 2 (Condition: *un, unos*) mixed design Analysis of Variance (ANOVA) with Condition as a

210

within subjects variable and Group as a between subjects variable. The results revealed a main effect for Group (F(1,48) = 7.942, p < .001) and a main effect for Condition (F(1,48) = 211.658, p < .001). There was also a significant interaction between Group X Condition (F(1,48) = 26.761, p < .001). Post hoc Bonferroni t-tests showed that only [s]-ChWC (p<.001) and [s]-ChMC (p<.05) children differed significantly from adults while [s]-MexWC children (p=1.0) did not differ significantly from adults. Also, [s]-MexWC children only differed significantly from [s]-ChWC children (p<.01) but not [s]-ChMC children (p=.102). The two [s]-Chilean child groups did not differ significantly from each other (p=1.0).

Independent samples t-tests showed a significant increase in plural responses in the indefinite plural condition for the ChWC children (t(1,19)=2.191,p<.05) when the plural is pronounced as [h] but no significant increase in plural responses for ChMC children (t(1,17)=.993,p=.335). However, because of the increase in plural responses when the plural was pronounced as [h], it is possible that [h]-Chilean children will not behave significantly different from [s]-MexWC children. For this reason, [h]-ChWC, [h]-ChMC, [s]-MexWC and [s]-Adults were compared. A one-way ANOVA comparing these four groups in the plural indefinite condition showed significant differences across the four groups (F(1,51)=6.887,p<.001). Post hoc Bonferroni tests showed that only [h]-ChWC children (p<.001), but not [h]-ChMC children (p=.197), differed significantly from adults.

Table 47 and Table 48 show the percentage of children who were systematic in their responses. Systematic responders are categorized as those who chose either the singular or plural picture in at least 3 out of 4 trials. Variable responders are children who

chose the plural picture in half of the trials (2 out of 4) and the singular picture in half of the trials.

Table 47. Study 3: *Unos*: Systematic Responders.

| | Systematic Plural Response (3-4 plural) | Systematic Singular Response (3-4 singular) | Systematic Total | Variable Plural Response (2 pl/ 2sg) |
|---|---|---|---|---|
| **Plural Pronounced as [s]** | | | | |
| **MexWC** | 100% | 0% | 100% | 0% |
| **ChMC** | 60% | 40% | 100% | 0% |
| **ChWC** | 20% | 70% | 90% | 10% |
| **Plural Pronounced as [h]** | | | | |
| **ChMC** | 78% | 11% | 89% | 11% |
| **ChWC** | 64% | 36% | 100% | 0% |

Table 48. Study 3: *Un*: Systematic Responders.

| | Systematic Plural Response (3-4 plural) | Systematic Singular Response (3-4 singular) | Systematic Total | Variable Plural Response (2 pl/ 2sg) |
|---|---|---|---|---|
| **Plural Pronounced as [s]** | | | | |
| **MexWC** | 8% | 92% | 100% | 0% |
| **ChMC** | 0% | 100% | 100% | 0% |
| **ChWC** | 20% | 80% | 100% | 0% |
| **Plural Pronounced as [h]** | | | | |
| **ChMC** | 11% | 89% | 100% | 0% |
| **ChWC** | 9% | 91% | 100% | 0% |

In general, children were systematic in their responses in the plural and singular indefinite conditions. Only 1 [s]-ChWC child and 1 [h]-ChMC child showed variable behavior in the plural indefinite condition.

## 5.3.6 Feminine vs. Masculine Nouns

As in Study 1 and 2, children did not behave significantly different in the feminine vs. masculine trials. Table 49 shows the percentage of plural responses in the masculine and feminine plural indefinite trials.

213

Table 49. Study 3: Plural Responses in Feminine and Masculine Trials.

| CONDITIONS | [s] | | | [h] | |
| --- | --- | --- | --- | --- | --- |
| | ChWC | ChMC | MexWC | ChWC | ChMC |
| unos | 20% | 60% | 92% | 59% | 78% |
| ('some.M.PL') | (4/20) | (12/20) | (22/24) | (13/22) | (14/18) |
| unas | 30% | 60% | 83% | 59% | 78% |
| ('some.F.PL') | (6/20) | (12/20) | (20/24) | (13/22) | (14/18) |

Paired samples t-tests showed no significant difference in the number of plural responses between the plural masculine vs. plural feminine indefinites for [s]-ChMC children (t(1,9)=0.0,p=1.0), [h]-ChMC children (t(1,9)=0.0,p=1.0), [s]-ChWC children (t(1,10)=-1.0,p=.343), [h]-ChWC children (t(1,10)=0.0,p=1.0), nor for MexWC children (t(1,11)=.804,p=4.38).

5.3.7 Discussion

Compared to Study 2, which appeared to be slightly harder for children, Study 3 showed an increase in the percentage of plural responses in the plural indefinite condition for all three child groups. The results of Study 3 show that when the plural morpheme is pronounced as [s] both ChWC and ChMC children differed significantly from adults in their comprehension of the plural morpheme while Mexican children did not. This finding is consistent with the findings in Study 1 and Study 2. However, Study 3 also showed that when the plural morpheme was pronounced as [h], only the ChWC children, but not the ChMC children differed significantly from adults. This increase in plural

214

responses in Chilean children who were presented with the plural variant [h] vs. those presented with the plural variant [s] indicates that more Chilean children associated [h] to an interpretation of 'more than one'. However, the results in the [h] version of the study also reveal that ChWC children, unlike Mexican children, still have not reached adult levels in their interpretation of the plural morpheme.

It is not clear at this point why Chilean children associated the plural variant [h] to 'more than one' in Study 3 but not in Studies 1 or 2. Given that the subjects are different in each of these three experimental studies, it could be simply due to the children who participated. However, the production data presented in Chapter 4 revealed that in free speech, [h] is the most frequent plural variant for ChWC adults and children and ChMC adults and children, with the ChWC adults and children producing more Ø than [h]. For this reason, it is not surprising that more Chilean children might associate [h] to and interpretation of 'more than one' before associating [s] to an interpretation of 'more than one'. Instead, it is surprising that in Studies 1 and 2 more children did not associate [h] to 'more than one'. Finally, as in Studies 1 and 2, gender of the noun phrase did not affect children's performance in Study 3.

5.3.8   Summary of Findings

The following is a summary of the results for the comprehension of plural morphology in Study 3.

1.  Chilean children differ from adults in their comprehension of plural morphology while Mexican children did not differ from adults.

2. When the plural morpheme is systematically produced in the adult speech, Mexican Spanish-speaking children associate it to an interpretation of 'more than one' by 5;1 years of age.

3. When no Highlighting Task is provided and the plural morpheme is pronounced as [s], ChWC and ChMC 5;5-year-old children do not associate the plural indefinite *unos* to the interpretation of 'more than one'.

4. More Chilean children associated [h] to the interpretation of 'more than one' than [s].

5. ChMC children, but not ChWC children, reached adult levels when the plural variant was pronounced as [h].

6. Almost all Chilean and Mexican children were systematic in their interpretation of the plural and singular indefinite noun phrases.

7. The difference in form between the plural and singular masculine noun phrases did not result in more correct responses in the masculine targets than on the feminine targets.

8. The findings from Study 3 are consistent with the findings from Studies 1 and 2, with the exception that ChMC children were adult-like when the plural morpheme was pronounced as [h].

5.4    Study 4. Elicitation Task: Bare Nouns and Indefinite Noun Phrases

Study 4 is not a comprehension task but rather an elicitation task. Nevertheless, it was placed within this chapter on comprehension because the experimental task was designed to provide information about whether children associate the plural morpheme to an interpretation of 'more than one'. Unlike the production tasks in Chapter 4, the

elicitation task presented here involves naming plural and singular objects in order to determine whether children will use the plural morpheme to distinguish 'more than one' from 'one'. If the only difference between children's descriptions of plural vs. singular objects is the plural morpheme, this would provide evidence that children associate the plural morpheme to the interpretation of 'more than one'. Hence, the purpose of Study 4 is to determine whether Chilean and Mexican children produce singular/plural minimal pairs. Finally, given that Chilean children and adults produced the plural variant [s] more often in the Naming Task in Chapter 4 than in any other production task, the Naming Task presented here will allow us to determine whether Chilean children use [s] to distinguish 'one' from 'more than one'.

## 5.4.1 Background

Study 4 asks the following questions: (1) Given that Chilean children often assign an interpretation of 'one' to the plural indefinite *unos/unas* will they use the indefinite plural to describe plural sets? (2) Will Chilean and Mexican children use the plural [s] variant to produce plural-singular minimal pairs when describing 'more than one' vs. 'one'?

## 5.4.2 Method and Design

An Elicitation Task was used where children were asked to name pictures of animals. Children were shown pictures of single animals and of plural sets of animals, as shown in Figure 12, followed by question (11). All pictures are shown in Appendix D.

Figure 12. Study 4: Sample Target Trial.
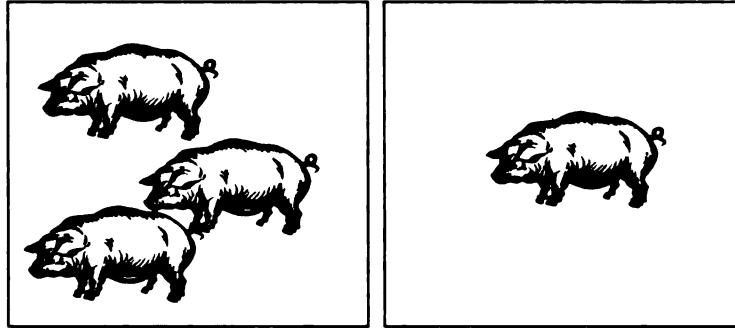


(11)    ¿Qué hay    aquí?

What EXST here

'What's here?'

The question in (11) has an existential verb, which is not marked for number and can occur with either plural nouns or singular nouns. For this reason, any plural nouns that are elicited from children will not be the result of children making the noun phrase agree in number with the verb, as may have been the case in the Naming Task discussed in Chapter 4. There were 16 pictures total: 8 singular pictures and 8 plural pictures. Table 50 shows the singular and plural forms of the nouns that were elicited from children. For every animal, both a singular picture and a plural picture were shown to the child so that we could elicit minimal singular-plural pairs. The pictures and order of presentation were the same for all children and are shown in Appendix D.

Table 50. Study 4: Target Words Elicited.

**/-s/ allomorph**

| Singular | | Plural | |
|---|---|---|---|
| *vaca* | 'cow' | *vacas* | 'cows' |
| *abeja* | 'bee' | *abejas* | 'bees' |
| *chancho/cochino* | 'pig' | *chanchos/conchinos* | 'pigs' |
| *perro* | 'dog' | *perros* | 'dogs' |
| *gato* | 'cat' | *gatos* | 'cats' |
| *elefante* | 'elephant' | *elefantes* | 'elephants' |

**/-es/ allomorph**

| | | | |
|---|---|---|---|
| *pez* | 'fish' | *peces* | 'fishes' |
| *ratón* | 'mouse' | *ratones* | 'mice' |

Of the four nouns used in Study 4, 2 were masculine and 2 were feminine, all 4 requiring the /-s/ allomorph. There were also 2 masculine nouns requiring the /-es/ allomorph. Finally, *elefante* was included because it requires an /-s/ allomorph but its plural form looks as if it has an /-es/ allomorph. If children have difficulty with the /-es/ allomorph, as previous studies suggest, they should do fine on the plural form of *elefante*, for example, but not on the plural form of *pez* and *ratón*.

### 5.4.3   Subjects

52 subjects participated in this study. 11 MexWC children (4;0-4;7, Mean: 4;2), 12 ChWC children (4;2-4;11, Mean: 4;7) and 7 ChMC (4;2-4;11, Mean: 4;4). In addition, 8 Mexican adults and 14 Chilean adults participated in this study. Mexican children and

219

adults were recruited from a preschool in Mexico City and the Universidad Autónoma

Metropolitana de Iztapalapa in Mexico City. The Chilean children and adults were

recruited from preschools and the Universidad de Magallanes in Punta Arenas, Chile.

Table 51. Study 4: Distribution of Children.

|  | Number | Age Range | Mean Age |
|---|---|---|---|
| **MexWC** | 11 | 4;0-4;7 | 4;2 |
| **ChMC** | 7 | 4;2-4;11 | 4;4 |
| **ChWC** | 12 | 4;2-4;11 | 4;7 |

### 5.4.4 Procedure

Subjects were tested in a quiet classroom. They were first presented with three

warm-up trials to get them used to talking and interacting with the researcher. These

practice tasks involved pointing to the larger or smaller of two circles, naming colors and

naming shapes. After the warm-up task, children were shown the first picture followed by

the question in (11). This task was very quick and simple for all children. Based on

recordings, noun phrases were transcribed and coded for whether the plural morpheme

was pronounced as [s] or not.

### 5.4.5 Results

All but one child produced [s] as the plural morpheme in at least one trial in plural

picture condition, and most children produced [s] as the plural morpheme at least 50% of

the time in the plural picture condition. On the other hand, all children produced the

singular indefinite noun phrases *un* ('a/one.M.SG') and *una* ('a/one.F.SG') when describing singular pictures. Figure 13 shows the percentage of time children and adults pronounced the plural morpheme as [s] when describing plural pictures.

Figure 13. Study 4: Percentage of Nouns with Plural Variant [s].
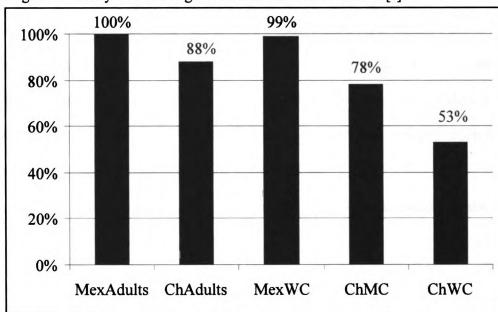


Figure 13 shows that, although there is variability in frequency with which children and adults produce the plural morpheme as [s] in the plural picture condition, all child and adult groups produce the plural morpheme as [s] some of the time. The number of plural nouns phrases produced by children and adults in the plural picture condition was placed into one-way ANOVA. The two adult groups were not combined given the differences in results between them. The results showed significant differences between the four groups (ChWC, ChMC, MexWC, ChAdults, MexAdults) ($F(1,51)=7.729,p<.001$). Post hoc Bonferroni t-tests showed only ChWC children differed significantly from Chilean adults

(p<.001). MexWC children did not differ from Mexican adults (p=1.0) and ChMC children did not differ from Chilean adults (p=1.0). Post hoc Bonferroni t-tests also showed that between the child groups, there were only significant differences between the ChWC and MexWC children (p<.001), but not between the ChWC and ChMC (p=.344) nor the MexWC and ChMC children (p=.975). These findings suggest that both ChMC and MexWC children, but not ChWC children, use [s] to describe plural sets, hence it must be the case that they associate [s] to 'more than one'. However, these findings only show us that subjects produced [s] as the plural morpheme, they do not tell us whether they produced the indefinite plural *unos/unas* to describe plural sets nor whether they produced plural-singular minimal pairs.

With respect to the types of noun phrases that children and adults produced, the results showed that, given the experimental question, ¿Qué hay aquí? ('What's here'), there were only a couple of different types of noun phrases produced. When shown the singular picture all children and adults produced indefinite noun phrases (e.g. *una vaca* 'a/one.SG cow.SG'). However, when shown a plural picture, there were at least three possible answers that children and adults provided: indefinite plural noun phrases (e.g. *unas vacas* 'some.PL cow.PL'), bare plurals (e.g. *vacas* 'cow.PL') and numerals (e.g. *tres vacas* 'three cows.PL'). The example in (12) shows the noun phrase type that all children and adults produced for the singular picture and the examples in (13) shows the noun phrase types that were produced for the plural pictures.

(12)   una      vaca

a/one.SG cow.SG

'a/one cow'


(13)   a.    unas     vacas

some.PL cows.PL

'some cows'


b.    vacas

cows.PL

'cows'


c.    tres  vacas

three cows.PL

'three cows'


The noun phrases in (12) and (13a) are minimal pairs with the only difference between the two being the presence or absence of the plural morpheme. Since all children used (12) to describe the singular picture, any children who use (13a) to describe the plural picture would appear to have plural morphology because they are using the plural morpheme alone to distinguish a singular set from a plural set. This is a very important point and was discussed in Chapter 3 where it was unclear in previous studies whether children were producing minimal pairs or not in a similar task (see Bedore and Leonard

2001). The findings from Study 1, Study 2, and Study 3 indicate that Chilean children, but not Mexican children, associate the plural indefinite (e.g. *unas vacas* 'some.PL cows.PL') to and interpretation of 'one' in the comprehension tasks. We attribute this to the variability in the input: if the plural morpheme is sometimes omitted in the input, the plural indefinite would sound like the word for 'one' in Spanish. If Chilean children associate the plural indefinite to 'one', they should not produce indefinite plurals when describing plural sets. Mexican children, on the other hand, could produce indefinite plurals (or any other type of plural NP) when describing plural sets since the previous comprehension studies in this dissertation indicate that Mexican children associated the plural indefinite to 'more than one'. Table 52 shows the percentage of noun types produced by all child and adult groups.

Table 52. Study 4: Percentage of Noun Types Produced.

|  | Indefinite NPs *unas vacas* 'some cows' | Bare NPs [s] *vacas* 'cows' | Bare NPs [h/0] *vaca/vacah*[20] 'cow/cows' | Numerals *3 vacas* '3 cows' | Other |
|---|---|---|---|---|---|
| **Mexican Adults** | 10% (6/63) | 22% (14/63) | 0% | 68% (43/63) | 0% |
| **Chilean Adults** | 4% (5/112) | 29% (32/112) | 2% (3/112) | 63% (70/112) | 2% (2/112) |
| **MexWC Children** | 80% (68/85) | 11% (9/85) | 0% | 5% (4/85) | 4% (4/85) |
| **ChMC Children** | 4% (2/53) | 53% (28/53) | 19% (10/53) | 24% (13/53) | 0% |
| **ChWC Children** | 7% (6/87) | 51% (44/87) | 42% (37/87) | 0% | 0% |

The results of noun types produced in Table 52 show that, while Mexican children produced plural indefinite NPs (e.g. *unas vacas* 'some.PL cows.PL') 80% of the time, ChWC children only produced plural indefinites 7% of the time and ChMC only 4% of the time (i.e. only 1 ChWC child and 1 ChMC child produced plural indefinites), which indicates, along with the findings in Studies 1, 2, and 3 that Chilean children do not associate the plural indefinite *unos/unas* to an interpretation of 'more than one' and furthermore, suggests that Chilean children have different strategies than Mexican children for encoding plurality. Mexican children appear to have a preference for the plural indefinite in the Naming Task presented here, while Chilean children prefer the

---

[20] The bare plural NPs were only coded as having the plural pronounced as [s] or not (i.e. [h] or zero). This decision was primarily made because we were interested to know whether ChMC and ChWC children would pronounce the plural morpheme as [s].

bare plural. This is expected given that many Chilean children systematically associated the plural indefinite to an interpretation of 'one' in the comprehension tasks presented in Studies 1, 2, and 3. It should also be noted that the production data in Chapter 4 showed that in free speech, Chilean adults produced just as many plural indefinites as Mexican adults. For this reason, the preference for plural indefinites by Mexican children in Study 4 cannot be due to Mexican adults producing more indefinite plurals in the input. Additionally, with respect to the two nouns *pez* ('fish.SG') and *ratón* ('rat.SG') that required [es] in their plural forms showed that, while Chilean children produced [ratone] and [ratones] in their plural descriptions, they produced [peses] and [pes] in their plural descriptions of 'fish'. The latter behavior for fish was also found for some Mexican children.

Another implication of the results presented in Table 52 is that, while the Mexican children appear to have matched the plural morpheme to any underlying representation for number because they are producing plural and singular minimal pairs (e.g. *unas vacas* 'some.PL cows.PL' vs. *una vaca* 'a/one.SG cow.SG') to describe plural and singular pictures, the results do not demonstrate this for Chilean children because they do not produce plural-singular minimal pairs but rather bare plurals vs. singular indefinites (e.g. *vacas* 'cows.PL' vs. *una vaca* 'a/one.SG cow.SG'). It may appear the Chilean children are more like adults than Mexican children because both adult groups produced very few plural indefinites. However, we must be cautious in this interpretation of the results given that the adults had a tendency to produce noun phrases headed by numerals.[21]

---

[21] Both of the adult groups and the ChMC children produced more noun phrases headed by numerals than the ChWC and MexWC children, which we assume is because ChMC children and adults have had more counting experiences than the other two child groups.

5.4.6 Discussion

The results of Study 4 reveal that both Mexican and Chilean adults and children use the plural morpheme [s] to describe plural sets. This suggests very strongly that the plural variant [s] occurs in the input to both Chilean and Mexican children and hence should be tested, in addition to [h], in the comprehension tasks. However, the results also showed that ChWC children used [s] significantly less so than Chilean adults and also Mexican children, which is consistent with the production data presented in Chapter 4 and indicates that ChWC children have less [s] in the input that the MexWC and ChMC children.

Study 4 also indicates that Chilean children do not use the plural indefinite *unos/unas* when describing plural sets while Mexican children do use plural indefinites. Instead, Chilean children used bare nouns (both with and without the plural morpheme [s]) to describe plural sets. This finding is consistent with Studies 1, 2, and 3, which indicate that Chilean children do not associate the plural indefinite to an interpretation of 'more than one'.

Finally, the findings from Study 4 show that, while Mexican children use plural-singular minimal pairs to describe 'more than one' and 'one' (e.g. *unas vacas* vs. *una vaca*), Chilean children do not. Instead, Chilean children use bare plurals to describe 'more than one' and indefinite singulars to describe 'one' (e.g. *vacas* vs. *una vaca*). For Chilean children, responses for the plural and singular picture differ with respect to the presence or absence of the plural morpheme and also of the determiner. Because children could produce any type of plural noun phrase in the plural picture condition, it is possible that the high number of bare plurals for Chilean children is simply a preference and

227

Chilean children actually do produce indefinite plurals to describe plural sets. While this might be the case, it is then unclear why Chilean children overwhelmingly prefer bare plurals and Mexican children overwhelmingly prefer plural indefinites. Given the findings from Studies 1, 2, and 3 the difference between Chilean and Mexican children in Study 4 seems to have to do with Chilean children's tendency to assign an interpretation of 'one' to plural indefinites. These differences between Chilean and Mexican children suggest that variability in the production of the plural morpheme has an effect on the strategies children use to encode plurality in their production.

### 5.4.7   Summary of Findings

The following is a summary of the results for the production of plural morphology in Study 4.

1. Both Chilean and Mexican adults and children use the plural variant [s] to varying degrees when describing plural sets.

2. Mexican children produce plural-singular minimal pairs when describing 'more than one' vs. 'one'.

3. Chilean children produce bare plurals vs. singular indefinites when describing 'more than one' vs. 'one'

4. Chilean children prefer bare plurals when describing plural sets and avoid plural indefinites.

5. The findings of Study 4 are consistent with those from Studies 1, 2, and 3, indicating that Chilean children do not appear to associate the plural indefinite *unos/unas* to 'more than one' and also indicating that ChWC children are exposed to an input with less [s] than the other two child groups.

## 5.5    Study 5. Picture Matching Task: Bare Singulars vs. Bare Plurals

Study 4 showed that Chilean children overwhelmingly produce bare plurals in their description of plural sets; however, because they also produce singular indefinites to describe singular sets their plural vs. singular descriptions do not form minimal pairs with the only difference being the plural morpheme. For this reason, we cannot conclude that Chilean children associate the plural morpheme with an interpretation of 'more than one'. Rather, it may be that Chilean children associate bare nouns with a 'more than one' interpretation. The purpose of Study 5 is to determine whether Chilean children associate the plural morpheme with an interpretation of 'more than one' by testing their comprehension of bare plurals vs. bare singulars.

### 5.5.1    Background

Study 5 tests Chilean children on their interpretation of bare plurals and bare singulars as in (14a) and (14b) below.


(14)    a.    ¿Cuál   niña tiene llave?

Which girl   has   key.SG

'Which girl has a key/keys?'


b.    ¿Cuál   niña tiene llaves?

Which   girl   has   keys.PL

'Which girl has keys?'

The bare singular in (14a) can refer to an interpretation of 'one' or 'more than one' while the bare plural in (14b) only refers to an interpretation of 'more than one'. Only Chilean children participated in Study 5, given that it was Chilean children who produced so many bare plurals in Study 4 and also given the fact that the distribution of bare singulars is much more restricted in Mexican Spanish than in Chilean Spanish. Bosque (1996) observes that Spanish bare singulars, in the dialects where they are found, are allowed as objects in certain contexts: as objects of intensional predicates like *buscar* (to look for), *querer* (to want), and *necesitar* (to need), as objects under negation, and in constructions that denote inherent properties of a particular entity or where the object has an unique interpretation (as in *Llevaba chaqueta* 'He was wearing a jacket', *Tenía casa en la montaña* 'He had a house in the mountains'). In our field-work, we have found that Chilean Spanish (more specifically the dialect of Punta Arenas) also allows non-intensional verbs to take bare singular objects (*Me compré auto* 'I bought myself a car', *Me conseguí perro* 'I got a dog', *Hicimos muralla* 'We put up a fire wall' (between our house and the neighbor's house), *Viste concha* 'You saw seashells', *Tengo que pagar cuenta* 'I have to pay bills').

Study 5 asks the following questions: (1) Will Chilean children distinguish between bare singular and bare plural noun phrases? (2) Will the Chilean children associate [s] or all bare nouns to an interpretation of 'more than one'?

5.5.2   Method and Design

A Picture Matching Task was used. Subjects were presented four short narratives (Figure 14) about a group of children who were taking a trip together. See Appendix E for the full set of narratives and pictures. After each short narrative, children were asked

230

questions like (15a) and (15c). For each short narrative, subjects were asked two questions with either bare plurals *llaves/libros* 'keys.F.PL/books.M.PL' or bare singular *llave/libro* 'key.F.PL/book.M.PL'. Questions like (15b), *¿Cuál niña no tiene nada?* ('Which girl has nothing?'), were used to draw children's attention back to the center of the picture. Although the pictures used in Study 3 and Study 5 are the same, the experimental questions and also children tested are not the same. All target trials involved nouns that can optionally occur bare in object position of *tener* ('to have') in Chilean Spanish: *llave* ('key'), *libro* ('book'), *pelota* ('ball'), *toalla* ('towel'), *moneda* ('coin'), *carta* ('letter'), *gato* ('cat'), *perro* ('dog'). There were 4 trials in the bare singular condition (like (8a) above), 4 trials in the bare plural condition (like (8b) above), 4 singular controls (*un solo* 'only one') and 4 plural controls (*muchos* 'many'). In addition, there were 10 fillers that came from another study examining the development of the copulas *ser* vs. *estar* in child Spanish. Although both feminine and masculine nouns were used, this did not matter for this particular study given that the nouns were bare and hence only the presence or absence of the plural morpheme provided number information. In the control condition, subjects could perform well even if they ignore the plural morpheme (*¿Cuál niño tiene un solo mono?* 'Which boy has only one monkey?').

Figure 14. Study 5: Sample Target Trial.
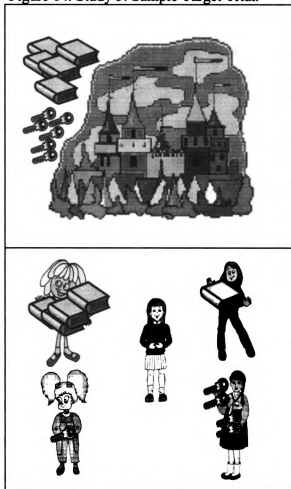


Researcher: "*Primero, fueron a conocer un castillo enorme porque en ese castillo había cosas muy interesantes. A ver, había _____ y _____. Al salir del castillo las niñas se llevaron algunas cosas. A ver, veamos que tiene cada niña.*" "First, they went to visit a big castle because in this castle there were many interesting things. Let's see, there were _____ and _____. Upon leaving the castle the girls took some things. Let's see what each girl has."

(15)   a.     *¿Cuál niña tiene libro?*

Which girl has   book

'Which girl has (a) book/books?'


b.     *¿Cuál niña no  tiene nada?*

Which girl NEG has   nothing

'Which girl doesn't have anything?'


c.     *¿Cuál niña tiene llaves?*

Which girl has   keys.PL?

'Which girl has keys?'


Given this experimental story and picture, when subjects are presented with a sentence like (15a) they should choose the girl with only one book or with several books, when subjects are presented with a sentence like (15c) they should choose only the girl with several keys.

### 5.5.3 Subjects

20 Chilean children participated in this study. 10 children were ChWC (4;4-5;8, Mean: 5;1) and 10 children were ChMC (4;6-5;11, Mean: 5;2). In addition, 10 Chilean adults participated. Children were recruited from preschools in Punta Arenas, Chile and adults were undergraduate college students at the Universidad de Magallanes in Punta Arenas, Chile.

### 5.5.4 Procedure

All subjects were tested by native speakers of Spanish who lived in the same city as the subjects. The author of this dissertation was present during the testing of all children to ensure that procedures were identical for all subjects. The plural morpheme was pronounced as [s] for all children. We chose to pronounce the plural morpheme as [s] for several reasons: (1) there was no determiner on the nouns; hence, the morpheme would be the only clue to number and [s] is acoustically more salient than [h], (2) Chilean children from Study 1 and Study 2 did not associate [h] to 'more than one' (3) ChMC children who did recognize [h] as the plural morpheme, often corrected the researcher when he pronounced the plural as [h] and (4) adults and Chilean children produced bare nouns with the plural morpheme [s] more than half the time in Study 4. All 8 target trials were presented first, followed by the fillers and then the 8 controls, as shown in Appendix E.

### 5.5.5 Results

While ChWC and ChMC children behaved the same in the control conditions, assigning a plural reading to *muchos* ('many.PL') 100% of the time and a singular reading to *un solo* ('only one') 100% of the time, they did not behave the same in the target conditions. The percentage of 'more than one' interpretations that children assigned to the bare singular and bare plural is shown in Table 53.

234

Table 53. Study 5: Plural Responses in Target Conditions.

| | Bare Singulars<br>vaca ('cow') | Bare Plurals<br>vacas ('cows.PL') |
|---|---|---|
| **Chilean Adults** | 2%<br>(2/40) | 100%<br>(40/40) |
| **ChWC Children** | 68%<br>(27/40) | 83%<br>(33/40) |
| **ChMC Children** | 48%<br>(19/40) | 95%<br>(38/40) |

The results show that, while adults preferred to associate the bare singular to an interpretation of 'one', the Chilean children did not. Rather, Chilean children allowed both a plural and singular reading for the bare singular. The adult behavior is surprising given that bare singulars can be associated to an interpretation of 'one' and also to an interpretation of 'more than one', making the experimental question ambiguous. It may be the case that adults were comparing the bare singular to the bare plural, which only allows a plural reading and assumed that a singular response was being elicited from them. In any case, both an interpretation of 'one' and 'more than one' are grammatical.

A mixed design ANOVA with condition (bare plural, bare singular) as a within subjects variable and group (Adults, ChMC, ChWC) as a between subjects variable showed a main effect for group ($F(1,27)=6.022, p<.01$) and for condition ($F(1,27)=76.164, p<.001$) and a significant interaction for group x condition

(F(1,27)=14.910,p<.001). Post hoc Bonferroni t-tests showed that both ChWC (p<.05) and ChMC (p<.05) children differed significantly from adults but not from each other (p=1.0).

For the child groups the results showed that, while ChMC children assigned a 'more than one' interpretation to the bare plural 95% of the time, they only assigned a 'more than one' interpretation to the bare singular 48% of the time. Planned comparison paired samples t-tests showed that ChMC children treated bare singulars significantly different from bare plurals (t(1,9)=4.146,p<.01). On the other hand, the results showed that ChWC children assigned a 'more than one' interpretation to bare plurals 83% of the time and a 'more than one' interpretation to bare singulars 68% of the time. Unlike for ChMC children, planned comparison paired samples t-tests showed that ChWC children did not treat bare singulars differently from bare plurals (t(1,9)=1.108,p=.297) These results suggest that ChMC children distinguish between plural and singular bare nouns while ChWC children do not, instead ChWC children associate bare singulars and bare plurals to an interpretation of 'more than one'.

The results of Studies 1, 2 and 3 showed that overall children were systematic in their comprehension of the plural morpheme. The percentage of subjects who were systematic in their interpretation of bare plurals and bare singulars in Study 5 is shown in Table 54 and Table 55.

Table 54. Study 5: Bare Plural: Systematic Responders.

| | Systematic Plural Response (3-4 plural) | Systematic Singular Response (3-4 singular) | Systematic Total | Variable Plural Response (2 pl/ 2sg) |
|---|---|---|---|---|
| **Plural Pronounced as [s]** | | | | |
| **ChMC** | 100% | 0% | 100% | 0% |
| **ChWC** | 80% | 10% | 90% | 10% |

Table 55. Study 5: Bare Singular: Systematic Responders.

| | Systematic Plural Response (3-4 plural) | Systematic Singular Response (3-4 singular) | Systematic Total | Variable Plural Response (2 pl/ 2sg) |
|---|---|---|---|---|
| **ChMC** | 30% | 30% | 60% | 40% |
| **ChWC** | 60% | 30% | 90% | 10% |

Table 54 shows that in the Bare Plural condition, ChWC and ChMC children systematically treated the bare plural as associated to an interpretation of 'more than one', while only 1 ChWC child systematically associated the bare plural to an interpretation of 'one' and 1 ChWC child treated the bare plural variably. On the other hand, Table 55 shows that in the Bare Singular condition almost half of the ChMC children were variable in their responses, while only 1 ChWC child was variable in his response patterns. The patterns of variability for the ChMC children is telling especially considering that ChMC

children were not variable, but rather systematic, in Studies 1, 2, and 3. This suggests that ChMC children associate the bare singular to both an interpretation of 'one' and 'more than one'. This cannot be concluded for the ChWC children given that they were not variable in their interpretation of the bare singular. However, we must be careful in this interpretation as both an interpretation of 'more than one' and 'one' are compatible with the bare singular.

Because Study 3 and Study 5 were very similar with the exception that Study 3 tested singular indefinites vs. plural indefinites (*un mono* vs. *unos monos* 'a/one.SG monkey.SG vs. some.PL monkeys.PL') while Study 5 tested bare singulars vs. bare plurals (*libro* vs. *libros* 'book.SG vs. book.PL'), the results of the two studies will be compared. Note that the subjects who participated in Study 3 were different from the subjects in Study 5 and we are comparing only the results of Study 3 where the plural morpheme was pronounced as [s], given that [h] was not tested in Study 5. Table 56 shows the ages of the Children in Study 3 and Study 5.

Table 56. Comparison of Ages in Study 3 and Study 5.

|        | Pronunciation | Number | Age Range | Mean Age |
|--------|---------------|--------|-----------|----------|
|        |               | **Study 3** |      |          |
| **ChMC** | [s]         | 10     | 5;0-5;4   | 5;2      |
| **ChWC** | [s]         | 10     | 5;1-5;6   | 5;3      |
|        |               | **Study 5** |      |          |
| **ChMC** | [s]         | 10     | 4;4-5;8   | 5;1      |
| **ChWC** | [s]         | 10     | 4;6-5;11  | 5;2      |

The percentage of plural responses for the plural indefinites and singular indefinites in Study 3 and the bare plurals and bare singulars in Study 5 for both the ChWC and ChMC children is shown in Figure 15.

Figure 15. Comparison of Plural Responses in Study 3 and Study 5.
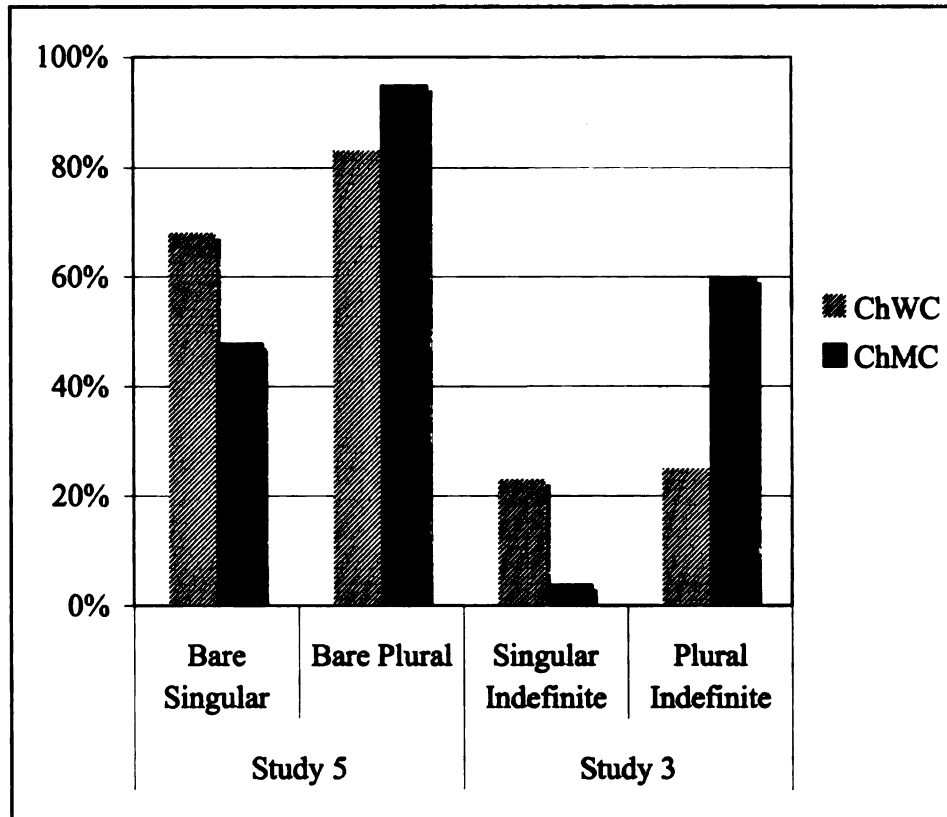


This comparison shows that when the plural morpheme is pronounced as [s], both ChWC

and ChMC children assign a plural reading to bare plurals (*libros* 'books.PL') and a

singular reading to the singular indefinites (*un mono* 'a/one.SG monkey.SG'), similar to

what they produced when describing plural vs. singular sets in Study 4. For this reason,

the results of Study 3 and Study 5, taken together, indicate that both ChWC and ChMC

children associate the singular indefinite to an interpretation of 'one' and the bare plural

to an interpretation of 'more than one'. This finding, however, does not show that

Chilean children associate the plural morpheme to an interpretation of 'more than one'.

The results of both studies also show that Chilean children associate the bare plural to an interpretation of 'more than one' more often than they associate the plural indefinite to an interpretation of 'more than one'. An independent t-test showed that Chilean children assigned a plural interpretation significantly more often to the bare plural than to the plural indefinite, even though the 'more than one' interpretation was the only correct answer in the contexts provided (ChWC: (t(1,18)=-4.445,p<.001), ChMC: (t(1,18)=-2.510,p<.05)).

5.5.6   Discussion

The results of Study 5 differ quite drastically from the results of Study 3 in that Chilean children overwhelmingly provided plural responses in Study 5 yet they overwhelmingly provided singular responses in Study 3. Given that the only difference between the two experimental studies was that Study 3 tested plural indefinites and singular indefinites while Study 5 tested bare plurals and bare singulars, suggests that Chilean children often associate the indefinite plural to an interpretation of 'one' while they associate the bare plural and bare singular to an interpretation of 'more than one'. While the results of Study 5 indicate that ChMC children distinguish between bare singulars and bare plurals, it appears that ChWC children do not, which suggests that ChWC children do not associate the plural morpheme to an interpretation of 'more than one' rather they associate bareness to an interpretation of 'more than one'. Further evidence supporting this idea comes from the production data presented in the Naming Task in Chapter 4, which showed that ChWC children produced bare singulars when describing plural sets 53% (90/171) of the time and bare plurals 47% (81/171) of the

241

time, while ChMC children only produced bare singulars 15% (6/40) of the time, ChWC Adults 9% of the time (2/22) and ChMC adults 13% (6/48) of the time.

### 5.5.7   Summary of Findings

The following is a summary of the results for the comprehension of plural morphology in Study 5.

1. ChWC children do not treat bare plurals differently from bare singulars while ChMC children do.

2. Chilean children overwhelmingly treat bare plurals as plural and singular indefinites as singular, which is consistent with their production in the Naming Task in Study 4.

3. ChWC children associate both bare singulars and bare plurals with an interpretation of 'more than one'. They appear not to associate the plural variant [s] to an interpretation of 'more than one'.

4. ChMC children associate the plural variant [s] to an interpretation of 'more than one'.

5. The findings of Study 5 are consistent with Studies 1, 2, 3, and 4.

### 5.6    Study 6. Act-out Task: Inalienable Possession

All of the studies presented up until now have dealt with indefinite and bare noun phrases. Study 6 examines children's ability to associate the plural morpheme to an interpretation of 'more than one' in definite noun phrases. It is important to test definite noun phrases, in order to determine whether Chilean children, especially ChWC children, incorrectly associate the plural morpheme to an interpretation of 'one' in other contexts or whether it is the lexical nature of the plural indefinite (its similarity in form to the

242

numeral 'one') that is causing difficulty for Chilean children. Definite noun phrases in constructions involving inalienable possession are tested in Study 6 and referential definite noun phrases are tested in Study 7.

## 5.6.1 Background

Study 6 investigates Chilean and Mexican children's interpretation of the plural feminine definite noun phrases: *la* vs. *las* (the.F.SG vs. the.F.PL) in constructions involving inalienable possession, as in (16).

(16)    a.    Tócale    la    rodrilla a  Carlita.

                    Touch.her the.SG knee.SG to Carlita

                    'Touch Carlita's knee.'

        b.    Tócale    las    rodillas a  Carlita,

                    Touch.her the.PL knees.PL to Carlita

                    'Touch Carlita's knees.'

In (16a) *la rodilla* ('the.SG knee.SG') refers to only one of Carlita's knees while in (16b) *las rodillas* ('the.PL knees.PL') refers to both of Carlita's knees. Study 6 asks the following questions: (1) Given the differences in the input, will Chilean children differ from Mexican children in their comprehension of definite plural noun phrases? (2) Will Chilean children with variable input associate the plural morpheme to the interpretation of 'more than one'? (3) Will Chilean children treat both [s] and [h] as associated to an interpretation of 'more than one'.

243

5.6.2   Method and Design

An Act Out Task was used. Subjects were shown a dolls (Figure 16) and asked to carry out activities as stated in (17a) and (17b).

Figure 16. Study 6: Sample Target Trial
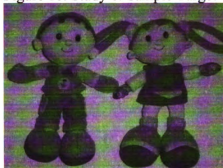


(17)   a.      Tócale      la      rodilla.

                Touch.her the.F.SG knee.F.SG

                'Touch her knee.'


       b.      Tócale      las      rodillas.

                Touch.her the.F.PL knees.F.PL

                'Touch her knees.'


The plural morpheme was always pronounced as [s] in the first experiment administered to Mexican and Chilean children and as [h] in the second experiment administered only to Chilean children. The definite nouns phrases were always feminine so that the only difference between the plural and singular noun phrases was the presence

or absence of the plural maker. Experimental Sentences are shown in APPENDIX F. In the target experimental sentences only the plural morpheme provides number information (la rodilla 'the.SG knee.SG' vs. las rodillas 'the.PL knee.PL'). Controls involved feminine definite noun phrases that were referential (*Dame las vacas* 'Give me the.PL cows.PL' vs. *Dame la vaca* 'Give me the.SG cow.SG').

### 5.6.3 Subjects

81 subjects participated in this study. 12 MexWC (4;7-5;6, Mean: 5;1), 16 ChWC (4;5-5;11, Mean: 5;3), 10 ChMC (4;6-5;11, Mean: 5;2) children and 20 adults (12 Chilean and 10 Mexican) participated in this study with the plural morpheme pronounced as [s]. Additionally, 14 ChWC (4;8-6;4, Mean: 5;4) and 7 ChMC (4;11-6;1, Mean: 5;6) children participated in this study with the plural morpheme pronounced as [h]. The Chilean children were recruited from preschools and daycares in Punta Arenas, Chile and the Mexican children from a daycare in Mexico City. Chilean adults were undergraduates at the Universidad de Magallanes in Punta Arenas, Chile and the Mexican adults were undergraduates at the Universidad Autónoma Metropolitana de Iztapalapa in Mexico City. Table 57 shows distribution of child subjects.

Table 57. Study 6: Distribution of Children.

|  | Pronunciation | Number | Age Range | Mean Age |
| --- | --- | --- | --- | --- |
| **MexWC** | [s] | 12 | 4;7-5;6 | 5;1 |
| **ChMC** | [s] | 10 | 4;6-5;11 | 5;2 |
|  | [h] | 7 | 4;11-6;1 | 5;6 |
| **ChWC** | [s] | 16 | 4;5-5;11 | 5;3 |
|  | [h] | 14 | 4;8-6;4 | 5;4 |

## 5.6.4 Procedure

All subjects were tested by native speakers of Spanish who lived in the same city as the subjects. The author of this dissertation was present during the testing of all children to ensure that procedures were identical for all subjects. All children and adults were able to perform well on controls and no children were discarded from this study. Subjects were presented first with the 4 singular definite target and control trials followed by the 4 plural definite target and control trials. Experimental sentences were presented in this order to avoid priming a plural response in Chilean children. Given that the plural morpheme can be omitted in Chilean adult Spanish, it might be the case that children who first hear a plural target trial might believe that subsequent singular trials are actually plural trials where the researcher is omitting the plural morpheme. Masculine definites were not tested because the singular masculine definite article is different in form from the plural masculine definite (*el* 'the.M.SG' vs. *los* 'the.M.PL').

## 5.6.5 Results

Although all children performed 100% on controls, they did not all perform the same in the target conditions. The dependent variable is the number of plural answers children gave. Moving two body parts was considered a plural response. Moving only one body part was considered a singular response. Table 58 shows the overall percentage of plural responses for MexWC, ChMC, and ChWC children.

Table 58. Study 6: Plural Responses in Target Conditions.

| | *las* ('the.PL') | *la* ('the.SG') |
|---|---|---|
| **Plural Morpheme Pronounced as [s]** | | |
| **MexWC** | 71% | 0% |
| | (34/48) | (0/48) |
| **ChMC** | 50% | 10% |
| | (20/40) | (4/40) |
| **ChWC** | 58% | 19% |
| | (37/64) | (12/64) |
| **Plural Morpheme Pronounced as [h]** | | |
| **ChMC** | 93% | 0% |
| | (26/28) | (0/28) |
| **ChWC** | 25% | 5% |
| | (14/56) | (3/56) |

The number of plural responses in the plural definite condition was entered into a one-way ANOVA. The results showed a significant difference between the four [s]-groups $(F_{(1,59)}=5.582, p<.01)$. [s]-ChMC $(p<.05)$ and [s]-ChWC $(p<.01)$ children behaved significantly different from adults but [s]-MexWC children $(p=.150)$ did not. However, the three child groups did not differ significantly from each other: [s]-MexWC vs.[s]-ChWC $(p=1.0)$, [s]-MexWC vs. [s]-ChMC $(p=1.0)$, [s]-ChMC vs. [s]-ChWC $(1.0)$.

Table 58 shows an increase in plural responses for ChMC children when the plural was pronounced as [h] but a decrease in plural responses for the ChWC children when the plural was pronounced as [h]. Independent samples t-tests showed a marginally significant decrease in plural responses in the [h] part of the study for ChWC children $(t_{(1,28)}=-2.030, p=.052)$ but no significant increase in the number of plural responses in the [h] part of the study for ChMC children $(t_{(1,15)}=1.597, p=.131)$. The inability to find significant differences here is most likely due to the few number of subjects in the [h] version of the study.

The number of plural responses for the [h]-ChWC, [h]-ChMC, [s]-MexWC and [s]-Adults was entered into a one-way ANOVA. The results showed significant differences between the three groups $(F_{(1,54)}=21.347, p<.001)$. Post hoc Bonferroni tests showed a significant difference between adults and [h]-ChWC children $(p<.001)$ but not between adults and [h]-ChMC $(p=1.0)$. [h]-ChWC children differed significantly from both [s]-MexWC children $(p<.001)$ and [h]-ChMC children $(p<.001)$; however, [h]-ChMC and [s]-MexWC children did not differ significantly from each other $(p=.644)$. When the plural morpheme is pronounced as [h] for the ChMC children, they behave more closely to adults than MexWC children do on definite plurals. These findings

suggest that ChMC children associate [h] to an interpretation of 'more than one' while ChWC children do not.

Studies 1, 2, and 3 showed that children were systematic in their responses, while Study 5 on bare plural and singular nouns showed that ChMC children were not systematic, but rather appear to be variable in their responses on the bare singular, which was an acceptable response. Table 59 and Table 60 show the percentage of systematic responders for Study 6.

Table 59. Study 6: *Las*: Systematic Responders.

|  | Systematic Plural Response (3-4 plural) | Systematic Singular Response (3-4 singular) | Systematic Total | Variable Plural Response (2 pl/ 2sg) |
|---|---|---|---|---|
| **Plural Pronounced as [s]** | | | | |
| **MexWC** | 67% | 25% | 92% | 8% |
| **ChMC** | 60% | 40% | 100% | 0% |
| **ChWC** | 56% | 38% | 94% | 6% |
| **Plural Pronounced as [h]** | | | | |
| **ChMC** | 86% | 0% | 86% | 14% |
| **ChWC** | 21% | 71% | 92% | 8% |

Table 60. Study 6: *La*: Systematic Responders.

| | Systematic Plural Response (3-4 plural) | Systematic Singular Response (3-4 singular) | Systematic Total | Variable Plural Response (2 pl/ 2sg) |
|---|---|---|---|---|
| **Plural Pronounced as [s]** | | | | |
| **MexWC** | 0% | 100% | 100% | 0% |
| **ChMC** | 11% | 89% | 100% | 0% |
| **ChWC** | 19% | 81% | 100% | 0% |
| **Plural Pronounced as [h]** | | | | |
| **ChMC** | 0% | 100% | 100% | 0% |
| **ChWC** | 0% | 93% | 93% | 7% |

Table 59 and Table 60 show that the majority of children were systematic in their responses. There were only 4 variable responders in the plural definite condition, 1 MexWC, 1 [s]-ChWC, 1 [h]-ChMC, and 1 [h]-ChWC child in the plural definite condition and 1 [h]-ChWC child in the singular definite condition.

### 5.6.6 Discussion

First of all, Study 6 seemed to be more difficult for children than the previous experiments, which may have to do with the fact that it involved inalienable possession. Given the sentence *Tírale las orejas* ('Pull his ears') it is not necessarily an incorrect response to just pull one ear. This may explain why more Mexican children treat the plural as singular; however, note that MexWC children did not behave significantly different from adults. In any case, given that all child groups were tested on the same

experiment, it is interesting to note that while [s]-ChMC, [s]-ChWC, and [h]-ChWC children behaved significantly different from adults, MexWC and [h]-ChMC children did not.

Another interesting finding is that ChMC children provide more plural responses (even more so than the MexWC children) for the plural definite when it is pronounced with aspiration [h], while the opposite is true for the ChWC children. This finding is interesting given that ChMC children had fewer plural responses in Studies 1 and 2 when the plural was pronounced as [h], preferring more [s]. Instead this finding is consistent with Study 3, which found ChMC children allowing both [s] and [h] as the plural morpheme. It is not clear why we find these differences existing between the studies. Because these studies involve different children, it appears that within the Chilean child groups there is a lot of variability in whether children prefer the [s] or [h] variant, or both. The findings of Study 6 indicate that, while MexWC children associate the plural morpheme on the definite noun phrases to an interpretation of 'more than one', ChWC children do not and ChMC children do only for the plural variant [h] but not for the variant [s]. These findings for ChWC children support the Variability Delay Hypothesis, which proposes that variability in the input will delay child comprehension of grammatical forms when the variability causes an ambiguity (involves omission) and is constrained not only by linguistic (phonological, grammatical) but also extra-linguistic (SES, age, sex) factors. However, it is not clear that the findings for ChMC children support the Variability Delay Hypothesis, given that the [h]-ChMC children performed at ceiling on this task. From the production data presented in Chapter 4 and in Cepeda (1995) it appears that there are more omissions in the speech of working-class adults than

in the speech of middle-class adults. This may explain why ChMC children associate [h] to an interpretation of 'more than one', at least in definite noun phrases more often than ChWC children.

### 5.6.7 Summary of Findings

The following is a summary of the results for the comprehension of plural morphology in Study 6.

1. [s]-ChWC, [h]-ChWC and [s]-ChMC children do not in general associate the plural morpheme in definite noun phrases to an interpretation of 'more than one'.

2. [h]-ChMC and MexWC children associate the plural morpheme in definite noun phrases to an interpretation of 'more than one'.

3. ChMC children associate [h] to an interpretation of 'more than one' but not [s]. ChWC children associate neither plural variant to a 'more than one' interpretation.

4. The findings of Study 6 are not consistent with Studies 1 and 2, which show that Chilean children do not associate [h] to an interpretation of 'more than one'; however, the findings for the [h]-ChMC children are consistent with Study 3, which do show that Chilean children associate [h] to an interpretation of 'more than one'. Differences in findings appear to be related to the fact that Studies 1, 2, and 3 focused on indefinites and Study 6 on definites.

### 5.7 Study 7. Act-out Task: Definite Noun Phrases

Thus far the findings from Studies 1-6 have shown that overall there are differences between Chilean and Mexican children in the development of plural morphology. While Mexican children consistently associate the plural morpheme to an interpretation of 'more than one', regardless of noun phrase type, Chilean children vary

252

in their interpretation of the plural morpheme depending on noun phrase type (indefinite plurals vs. bare plurals vs. definite plurals) and also depending on whether their plural is pronounced as [s] or [h] in the experimental task. These findings suggest that overall ChWC children do not associate the plural morpheme to an interpretation of 'more than one' while ChMC children do. In addition, the behavior of ChMC children is dependent on noun phrase type, with better performance on bare nouns and definites than on indefinite noun phrases.

On the same token, the findings of Study 6 showed that in general the task may have been slightly more difficult than previous studies given the fewer number of 'more than one' responses in Mexican children. I suggested that the inalienable construction may have been responsible for this difference given that in some cases a singular response in a plural condition is acceptable. For this reason, the purpose of Study 7 is to test Chilean and Mexican child interpretation of the plural morpheme in definite noun phrases with a referential interpretation.

## 5.7.1 Background

The final study in this dissertation, Study 7, tests children on definite noun phrases, as in (18).

(18)  a.  Dame    la      muñeca  durmiendo al lado de la casa.

Give.me the.F.SG doll.F.SG sleeping    next to   the house

'Give me the doll sleeping next to the house.'

b.    Dame   las    muñecas durmiendo al lado de la  casa.

Give.me the.F.PL dolls.F.PL sleeping   next to   the house

'Give me the dolls sleeping next to the house.'

Study 7 asks the following questions: (1) Given the differences in the input, will Chilean children differ from Mexican children in their comprehension of plural definite noun phrases? (2) Will there be an increase in plural responses for all three child groups in Study 7 as compared to Study 6, given that the definite is not in a construction involving inalienable possession?

### 5.7.2   Method and Design

An Act-out Task was used. A display as diagrammed in Figure 17 was presented to subjects followed by commands as in (18a) and (18b) above.

Figure 17. Study 7: Diagram of Sample Target Trial.

| House | Barn |
|-------|------|
| Doll A | Doll 1 |
| Doll B | Doll 2 |
| Doll C | Doll 3 |
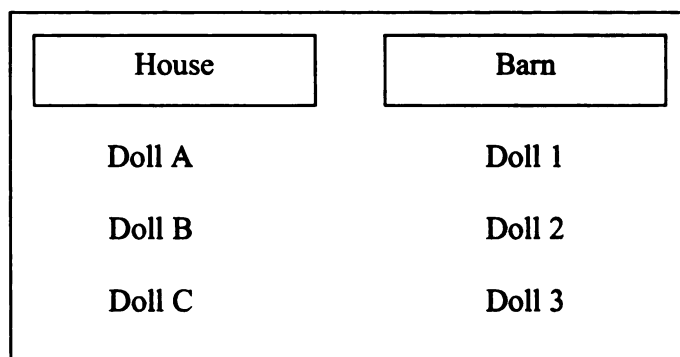
There were two controls: una ('a/one.sg') and *todas* ('all.PL'). As a result, there were 4

trials for each of the 4 noun phrase types (*todas* 'all.PL', *una* 'a/one.PL', *las* 'the.PL', *la*

'the.SG'). In addition, there were 8 fillers that involved questions about the animals in the

scene. All nouns were feminine so that the only difference between the plural and

singular forms was the presence or absence of the plural morpheme. The nouns were:

*muñecas* 'dolls', *vacas* 'cows', *hormigas* 'ants', *arañas* 'spiders'. All toys were miniature

so that children could easily pick up more than one toy at a time.

The materials and methods were the same for all children except there were 20

Mexican children who received a different version of the target sentences, as shown in

(19a) and (19b). 10 Mexican children received the target sentences as in (18a) – (18b)

above and 20 received the target sentences with participles as (19a) and (19b) below.

This was done because the Mexican researchers preferred sentences with participles like

(19) while Chilean researchers preferred the sentences with gerunds (18).


(19)   a.     Dame    la     muñeca dormida al lado de la  casa.

                Give.me the.SG doll.SG  asleep.SG next to    the house

                'Give me the doll (that are) asleep next to the house.'


       b.     Dame    las    muñecas dormidas al lado de la  casa.

                Give.me the.PL dolls.PL  asleep.PL next to    the house

                'Give me the dolls (that are) asleep next to the house.'

If children hear the sentence with the plural definite (18b or 19b), they should choose the maximal set of toys next to the house (i.e. Dolls A, B, and C). If they hear the sentence with the singular definite (18a or19a), they should choose the one toy that is closest to the house (i.e. Doll A). The dolls in front of the barn (Dolls 1, 2, and 3) are needed to make the plural definite condition felicitous. In other words, a modifying relative clause is only needed if there is an alternative set of dolls the speaker could be referring to.

Responses were counted as plural if the subject chose 'more than one' toy and singular if subjects chose only one toy. The plural morpheme was pronounced as [s] for all children. The plural morpheme pronounced as [h] was not tested in this study. All experimental sentences are shown in Appendix G.

## 5.7.3   Subjects

74 subjects participated in this study. 30 MexWC children (3;2-6;2, Mean: 4;6), 10 ChMC children (4;2-6;1, Mean: 5;0), and 12 ChWC children (4;3-5;11, Mean: 4;9) and 22 adults (14 Chilean and 8 Mexican) participated in Study 7. Mexican children and adults were recruited from a preschool and the Universidad Autónoma Metropolitana de Iztapalapa in Mexico City. The Chilean children and adults were recruited from preschools and the Universidad de Magallanes in Punta Arenas, Chile.

## 5.7.4   Procedure

The procedure and materials were the same for all children. Subjects were tested by native-speakers who were from the same town as the subjects. The author of this dissertation was present at all testing to ensure that procedures were the same. Children were first tested on their understanding of the preposition *al lado de* ('next to'). All children showed understanding of the prepositional phrase. Next, children were presented

with one or two practice trials involving *todos* ('all.PL') and *un* ('a/one') to ensure that they understood that they had to pay attention to the quantity of objects the researcher was asking for. Next, the researcher presented the main part of the experiment, as shown in Figure 18.

Figure 18. Study 7: Sample Experimental Story.

> Researcher: *"Mira. Muñecas. Y durmiendo, durmiendo, durmiendo, durmiendo, durmiendo, y durmiendo (researcher says "durmiendo" as he lays down each doll). Yo te voy a decir cuántas me tienes que dar y tú me da la cantidad que yo te digo. ¿Te parece?"* "Look. Dolls. And sleeping, sleeping, sleeping, sleeping, sleeping, and sleeping (researcher says each gerund as he lays down each doll). I am going to tell you how many you have to give me and you give me the quantity that I tell you. Ok?"

Following this presentation, the researcher preceded with the experimental questions.

## 5.7.5 Results

All children behaved the same on the control *todas* ('all.PL'), giving the maximal set to the researcher 100% of the time and the control *una* ('a/one.SG'), giving only one item almost all of the time. However, children did not behave the same in all of the target conditions. Table 61 shows the percentage of plural responses that subjects provided for the plural and singular definites.

Table 61. Study 7: Plural Responses in Target Conditions.

| | la ('the.F.SG') | las ('the.F.PL') |
|---|---|---|
| **Adults** | 0% | 100% |
| **MexWC** | 8% | 96% |
| | (10/120) | (115/120) |
| **ChMC** | 18% | 80% |
| | (7/40) | (32/40) |
| **ChWC** | 50% | 90% |
| | (24/48) | (43/48) |

Looking first at the plural definite condition we see that all four groups associated the

plural definite to a 'more than one' interpretation more than 80% of the time. A one-way

ANOVA showed that all four groups (Adults, MexWC, ChMC and ChWC) differed

significantly in the number of plural responses they provided in the definite plural

condition *las* ($F(3,73)=4.668,p<.01$). Post hoc Bonferroni tests revealed that only ChMC

children differed significantly from adults ($p<.01$), while ChWC ($p=.327$) and MexWC

($p=1.0$) children did not. Post hoc Bonferroni tests also showed that ChMC differed

significantly from MexWC children ($p<.05$) but not from ChWC children ($p=.817$) on the

definite plural. ChWC and MexWC children did not differ from each other ($p=1.0$).

Looking just at the plural definite condition, it appears that all four groups associate the

plural variant [s] on plural definites with an interpretation of 'more than one.' However, the results for the singular definites must also be considered.

In the singular definite condition, while the MexWC and ChMC children in general associated the singular definite to an interpretation of 'one', the ChWC children associated the singular definite to an interpretation of 'more than one' about 50% of the time. In the singular definite condition, a one-way ANOVA showed that all four groups differed significantly in the number of plural responses they provided $(F(3,73)=16.723, p<.001)$. Post hoc Bonferroni tests showed that only ChWC children differed significantly from adults $(p<.001)$ but not ChMC $(p=.167)$ nor MexWC $(p=.904)$ children. ChWC children also behaved significantly different from the ChMC $(p<.01)$ and MexWC $(p<.001)$ children by providing more plural responses in the singular definite condition. ChMC and MexWC children did not differ from each other $(p=1.0)$. The results show that, while all groups treated the plural definite as plural, they differ in their interpretation of definite singulars. ChMC and MexWC children associate the singular definite to 'one' while ChWC children associate the definite singular to an interpretation of 'more than one' approximately 50% of the time.

Studies 1, 2, 3 and 6 showed that children were systematic in their response patterns. The only time children were not systematic in their response patterns was in Study 5 where ChMC children associated the bare singular to both a 'more than one' and 'one' interpretation. The response patterns of children in Study 7 are shown in Table 62 and Table 63.

Table 62. Study 7: *Las*: Systematic Responders.

| | Systematic Plural Response (3-4 plural) | Systematic Singular Response (3-4 singular) | Systematic Total | Variable Plural Response (2 pl/ 2sg) |
|---|---|---|---|---|
| **Plural Pronounced as [s]** | | | | |
| **MexWC** | 100% | 0% | 100% | 0% |
| **ChMC** | 80% | 20% | 100% | 0% |
| **ChWC** | 83% | 0% | 83% | 17% |

Table 63. Study 7: *La*: Systematic Responders.

| | Systematic Plural Response (3-4 plural) | Systematic Singular Response (0-1 singular) | Systematic Total | Variable Plural Response (2 pl/ 2sg) |
|---|---|---|---|---|
| **Plural Pronounced as [s]** | | | | |
| **MexWC** | 7% | 93% | 100% | 0% |
| **ChMC** | 10% | 80% | 90% | 10% |
| **ChWC** | 42% | 33% | 75% | 25% |

The results in the above tables show that in both the plural definite and singular definite conditions children were generally systematic in their response patterns. However, the tables also show that 2 ChWC children were variable in their response patterns in the definite plural condition and 3 ChWC children were variable in their response patterns in the plural definite condition.

## 5.7.6  Discussion

Study 7 showed that ChWC children, but not ChMC children, differ from MexWC children in their comprehension of plural and singular definites. While ChMC children and MexWC children associate the plural definite with an interpretation of 'more than one' and the singular definite with an interpretation of 'one', approximately half the ChWC children associated both the singular definite and the plural definite with an interpretation of 'more than one'. These findings indicate that while ChMC and MexWC children associate the plural morpheme in definite noun phrases with an interpretation of 'more than one', ChWC children do not. Rather, the increase in plural responses in the plural definite condition is accompanied by an increase in plural responses in the singular definite condition, which suggests that the plural response has to do with the definiteness of the noun phrase and not the plural morpheme.

The findings of Study 7 also show that, unlike Study 6, ChMC children associate the plural variant [s] with an interpretation of 'more than one'. It is unclear why we find differences among the various comprehension studies as to which of the two plural variants ChMC children associate with 'more than one'. It may simply be due to differences between the children who participated in each of the studies. Future research is needed to clarify these findings.

Finally, Study 7 showed a slight increase in plural responses for MexWC children when compared to Study 6 with construction involving inalienable possession, which suggests the experimental task in Study 7 may have been easier for children.

### 5.7.7 Summary of Findings

The following is a summary of the results for the comprehension of plural

morphology in Study 7.

1. [s]-ChWC children do not associate the plural morpheme in definite noun

phrases to an interpretation of 'more than one'.

2. [s]-ChMC and MexWC children associate the plural morpheme in definite

noun phrases to an interpretation of 'more than one'.

3. The findings of Study 7 are consistent with Studies 1 and 2, which show that

ChWC children do not associate [s] with an interpretation of 'more than one'; however,

they are inconsistent with Study 6, which shows that ChMC children do not associate [s]

to an interpretation of 'more than one'. In Study 7 ChMC children do associate [s] to

'more than one'. It appears that there is more variability in the comprehension of plural

morphology by ChMC children than for ChWC children.

### 5.8    Summary and Discussion

The findings of the comprehension studies in Chapter 5 show different results for

the three groups of children. For the MexWC children the results show that they associate

the plural morpheme to an interpretation of 'more than one' at 5 years of age. Studies 1,

2, and 3 show that they assign a 'more than one' interpretation to indefinite noun phrases

*unos/unas* ('some.PL') and *algunos/algunas* ('some.PL'); however, Study 1 indicates that

MexWC children do not assign a 'more than one' interpretation to overt partitives

*algunos de los* (some.PL of the.PL). It is unclear why MexWC children had difficulty with

plural overt partitives. This will be left to future research. The results of Studies 6 and 7

show that MexWC children associate the plural morpheme to an interpretation of 'more

than one' in definite noun phrases. Finally, the results of Study 4 show that MexWC children prefer to produce singular-plural minimal pairs in their description of singular and plural sets (e.g. *una vaca* 'a/one.SG cow.SG' vs. *unas vacas* 'some.PL cows.PL'). Taken together, Studies 1-7 show that MexWC children associate the plural morpheme to an interpretation of 'more than one'.

For the ChWC children the results indicate that most children do not associate the plural morpheme to an interpretation of 'more than one' in any of the experimental tasks carried out. In Studies 1, 2, and 3 ChWC children assign an interpretation of 'one' to both plural and singular indefinite noun phrases *unos/unas* ('some.PL') and *algunos/algunas* ('some.PL') and in Studies 6 and 7 they assign a 'more than one' reading to both plural and singular definite noun phrases. The results also indicate that ChWC children do not distinguish between bare singulars and bare plurals, instead they assign a plural reading to all bare nouns. Moreover, the results show that ChWC children do not reach adult levels regardless of whether the plural is pronounced as [s] or [h] in the experimental study. The findings in Studies 1-7 show that ChWC children do not associate the plural morpheme to an interpretation of 'more than one'. The results for ChWC children, taken together with the results for MexWC children, support the Variability Delay Hypothesis.

Finally, the results for the ChMC children indicate that they associate the plural morpheme to an interpretation of 'more than one' in the experimental tasks carried out; however, their performance at times does not reach adult levels. Studies 1, 2 and 3 show that ChMC children assign an interpretation of 'one' to the plural indefinite *unos/unas* ('some.PL'). However, when the plural indefinite is highlighted, as in Study 1, ChMC children associate the plural indefinite to 'more than one'. Study 1 also showed that

ChMC children associated the plural indefinite *algunos* ('some.pl') to 'more than one' but that many ChMC also incorrectly associated the singular overt partitive *uno de los* (one.SG of the.PL') to an interpretation of 'more than one'. This suggests that ChMC children were hypercorrecting, assuming that the researcher omitted the plural morpheme on *uno* ('one.SG'). Moreover, Studies 6 and 7 show that ChMC children associate plural definites to 'more than one' and singular definites to 'one'. Study 5 indicates that ChMC children distinguish between bare singulars and bare plurals. While ChMC children, like MexWC children, appear to associate the plural morpheme to an interpretation of 'more than one', they behave differently from MexWC children on the plural indefinites *unos/unas* and the overt partitive *uno de los*. Moreover, while MexWC children prefer the plural indefinites in their description of plural sets in Study 4, ChMC children behave like ChWC children in preferring bare plurals. This suggests that MexWC children and ChMC children differ in their development of plural morphology. ChMC children appear to pay attention to both lexical information of the determiner and also the plural morpheme. When there is a conflict between the two, as is the case with the indefinite plural *unos/unas*, which is the numeral 'one' *uno/una* + the plural morpheme, ChMC children have difficulty with their interpretation.

CHAPTER 6

SUMMARY AND CONCLUSIONS

6.1     Goal of Dissertation

This dissertation assumes that language acquisition involves two components: an innate component, often referred to as a language acquisition device (LAD), and the input. While I assume that the LAD is invariable across typically developing populations, the input that children are exposed to varies. The purpose of this dissertation was to examine how different types of input affects the acquisition of grammatical morphemes in children. Specifically, this research asked whether children exposed to systematic vs. variable input would differ in their development of grammatical morphology. In order to answer this question, the acquisition of plural morphology in two varieties of Spanish was examined, Mexican Spanish (Mexico City) where plural morphology is systematically produced by adult speakers and Chilean Spanish where plural morphology has a variable behavior and is sometimes omitted by adult speakers.

With respect to production, it was predicted that children exposed to an input that systematically marks plural morphology would also systematically mark plural in their own production and that children exposed to variable plural marking would be variable in their own production. This prediction is based on previous research showing that by 3 years of age children produce plural morphology systematically when exposed to systematic input (Berko 1958, Kernan and Blount 1966, Brown 1973, Cazden 1968, Perez-Pereira 1989, Mervis and Johnson 1991, Kvaal et al. 1988, Marrero and Aguirre 2003) and that children exposed to variable input are also variable in their own speech even as early as 4 years of age (Ramer and Rees 1973, Moore 1979, Kovac and Adamson

1981, Washington and Craig 1994, Roberts 1994, 1997). However, it was also predicted that children exposed to variable input may not have acquired all the linguistic and extra-linguistic constraints governing that variability even at 7 years of age. This prediction is consistent with research by Roberts (1994, 1997) and Smith et al. (2006).

There are almost no studies examining the effect of variable input on the comprehension of grammatical morphemes and very few experimental studies on the comprehension of plural morphology in children exposed to systematic input. The few studies that do exist have been carried out recently in English (Kouider et al. 2006, Munn et al. 2006). As far as we know, there are no studies that have examined the comprehension of plural morphology in Spanish-speaking children exposed to systematic input. Given what little we know about the comprehension of plural morphology in children, there were two possible outcomes of the experimental studies presented in this dissertation: (1) No differences would exist between children exposed to systematic vs. variable input. Rather, as long as the plural morpheme is available in the input at least some of the time, both Mexican and Chilean children would comprehend the plural morpheme by 5 years of age. (2) Differences would exist between children exposed to systematic vs. variable input. Children exposed to systematic input would acquire plural morphology earlier than children exposed to variable input. In other words, variable input involving omission would create an ambiguity and this ambiguity would cause a delay in comprehension, in associating the plural morpheme to an interpretation of 'more than one". Based on research suggesting that variable input involving omission delays comprehension of grammatical morphemes (Moore 1979, Johnson 2005), we predicted

outcome (2), that differences would be found between Chilean vs. Mexican children and we proposed the Variability Delay Hypothesis, which is based on Yang (2000, 2002).

(1)    Variability Delay Hypothesis (based on Yang 2000, 2002): Variability in the input will delay child comprehension of grammatical morphemes when the variability causes an ambiguity in the input (involves a zero form) and is constrained not only by linguistic (phonological, grammatical) but also extra-linguistic (SES, age, sex) factors.

Differences in comprehension of plural morphology between Mexican and Chilean child groups would lend support to the Variability Delay Hypothesis. If no differences are found, the variability hypothesis would be rejected.

6.2    Summary and Discussion of Findings

The research presented in this dissertation collected experimental data on both the production and comprehension of plural morphology by Chilean and Mexican Spanish-speaking children. The findings of the production data will first be discussed followed by the findings of the comprehension data.

Production data was collected from both Chilean and Mexican adults and children. There were three experimental tasks that varied in degree of formality: a Free Speech task, a Repetition Task and a Naming Task. The main findings of the production data showed that (1) Mexican children and adults systematically produce the plural morpheme as [s] (and [z]) while Chilean adults and children have variable production, producing the plural morpheme as [s], [h] and also omitting the plural morpheme on semantically plural elements within the determiner phrase; (2) Chilean working-class

children and adults both omit the plural morpheme more often than Chilean middle-class children and adults; (3) While Chilean working-class and middle-class children are variable in their production of the plural morpheme, they have not yet acquired all of the linguistic and extra-linguistic constraints governing that variability at 5 years of age. These findings suggest that systematic input results in systematic production in children while variable input results in variable production in children, even if children have not yet acquired all of the constraints governing the variability. The findings also suggest that at 5 years of age, children are still acquiring the constraints that govern variation in their language. These findings are consistent with our predictions and with what has previously been reported in the literature on child production of plural morphology and child production of variation.

This dissertation presented 8 experimental studies on child comprehension of plural morphology. The comprehension studies examined whether children exposed to systematic vs. variable input distinguished between plural and singular indefinite noun phrases, definite noun phrases and bare nouns. Mexican children were tested on the plural morpheme /s/ (realized as [s] and [z]) while Chilean children were tested on both [s] and [h]. The overall findings of the comprehension data showed that (1) Chilean children differ from Mexican children in their comprehension of the plural morpheme on indefinite noun phrases. Mexican children associate plural indefinites to an interpretation of 'more than one' while many Chilean middle-class children and several Chilean working-class children do not; (2) Chilean children, who have plural morphology, may associate either [s] and/or [h] to an interpretation of 'more than one'; (3) Mexican children consistently produce singular-plural indefinite noun phrase minimal pairs (*una*

*vaca* 'a/one.SG cow.SG' vs. *unas vacas* 'some.PL cows.PL) when describing singular and

plural sets while Chilean children do not. Instead, Chilean children consistently produce

bare plurals (and sometimes bare singulars) vs. singular indefinites (*vacas* 'cows.PL' or

*vaca* 'cow.∅' vs. *una vaca* 'a/one.SG cow.SG'); (4) Chilean working-class children treat

bare singulars and bare plurals the same, associating both to an interpretation of 'more

than one' while Chilean middle-class children treat bare singulars and bare plurals

differently, associating the bare plural to an interpretation of 'more than one' and

allowing both a singular and plural interpretation of the bare singular; (5) Mexican

children associate the plural morpheme to an interpretation of 'more than one' in definite

noun phrases involving inalienable possession, while many Chilean middle-class children

associate [h] but not [s] to an interpretation of 'more than one' and many Chilean

working-class children do not associate neither [s] nor [h] to an interpretation of 'more

than one' on definite noun phrases involving inalienable possession; and (6) Mexican

children and Chilean middle-class children distinguish between plural vs. singular

definite noun phrases that are referential in nature when the plural is pronounced as [s]

while Chilean working-class children do not.

Based on these overall findings for comprehension, we can conclude that by 5

years of age Mexican working-class children have acquired plural morphology. In other

words, Mexican children associate the plural morpheme to an interpretation of 'more than

one'. In this sense, Mexican child comprehension patterns with Mexican adult

comprehension. On the other hand, the results strongly suggest that most 5-year-old

Chilean working-class children do not yet associate plural morphology (pronounced as

[s] or [h]) to an interpretation of 'more than one'. This seems to be the case regardless of

the type of noun phrase (e.g. indefinite, definite, or bare) that Chilean working-class children are tested on. Finally, the results for the Chilean middle-class children are a bit more difficult to interpret. The findings on indefinite noun phrases suggests that Chilean middle-class children have a strong tendency to initially assign an interpretation of 'one' to plural indefinites *un/una* ('a/one.SG') and *unos/unas* ('some.PL') and that they avoid using plural indefinites when expressing an interpretation of 'more than one'. Instead, they rely on bare plurals. However, Chilean middle-class children appear to associate the plural morpheme [s] and [h] to an interpretation of 'more than one' on definite noun phrases and bare nouns. Taken together, the findings for Chilean middle-class children suggest that most of them associate the plural morpheme [s] and/or [h] to an interpretation of 'more than one' but that indefinite noun phrases cause some extra distraction, which is most likely due to the fact that the indefinite determiner is also the word for 'one' in Spanish. Importantly, the indefinite noun phrase does not cause any distraction for Mexican working-class children, which suggests that the variable input to Chilean children still affects Chilean middle-class children in their development of plural morphology to some extent.

The findings of this dissertation also reveal that production of plural morphology appear to precede comprehension of the plural morpheme. While Chilean children produced the plural morpheme in their own speech some of the time, they did not always associate the plural morpheme to an interpretation of 'more than one'. This finding is consistent with previous research that has shown that English-speaking children start producing the plural morpheme at around 1;10 years of age (Ferenz and Prasada 2002)

but do not associate the plural morpheme to an interpretation of 'more than one' until 3 years of age (Kouider et al. 2006).

A finding of this dissertation that is difficult to explain is Chilean child performance in comprehension tasks when the plural morpheme was pronounced as [s] vs. [h]. While the overall finding was that several Chilean children do not associate [s] nor [h] to an interpretation of 'more than one', among those children who did appear to have plural morphology, the percentage of times that [s] or [h] was associated to 'more than one' varied between experimental studies. In Study 1 and Study 2 (Section 5.1 and 5.2), which tested children on their interpretation of plural and singular indefinites, more Chilean children associated the plural variant [s] to an interpretation of 'more than one' than [h] to this interpretation. However, in Study 3 (Section 5.3), which also tested children on their comprehension of plural and singular indefinites, the opposite pattern was found, where more Chilean children associated [h] to an interpretation of 'more than one' than [s]. In addition, in Study 6 (Section 5.6), which tested plural definite noun phrases in structures involving inalienable possession, we find that only ChMC children, but not ChWC children, associated the plural variant [h] to an interpretation of 'more than one' more often than the plural variant [s]. For this reason, it is unclear whether one of the two variants is initially acquired as the plural morpheme and how Chilean children initially acquire lenition. Future research will address these questions.

6.3     Conclusions

The findings reported in this dissertation lend support to the Variability Delay Hypothesis. Variability in the input that involves omission of the plural morpheme causes a delay in the comprehension of plural morphology by many Chilean children. While it

might have seemed reasonable to predict that as long as Chilean adult speakers produced the plural morpheme on semantically plural nouns some of the time, that would be enough for Chilean children to acquire the plural morpheme and associate it to an interpretation of 'more than one'. However, this is not the case. Instead, it appears that the ambiguous nature of the input that Chilean children are exposed to causes a delay in their comprehension of the plural morpheme.

The findings reported in this dissertation also lend support to the theoretical proposal that languages change due to a mismatch between the adult I-language (the input to children) and the adult E-language (Kroch 1994, 2001, Yang 2000, 2002). This dissertation assumes that child language acquisition involves the interaction between an innate component that allows all humans to acquire language (e.g. the LAD) and the linguistic input (or adult speech) that children are exposed to. Yang (2000, 2002) proposes that languages change when the input that adults provide children (adult E-language) does not match the adult grammar (I-language) and as a result children acquire a grammar (I-language) that differs slightly from their parents. Over time, this may result in language change as children grow into adults and provide a slightly different input to their own children than what was provided to them.

The experimental data presented in this dissertation show that while Chilean adults always associate the plural morpheme to an interpretation of 'more than one' in comprehension tasks, they do not always produce the plural morpheme on semantically plural nouns in their own speech. In this sense, we might conclude that the Chilean adult I-language has a representation for plural morphology while the adult E-language does not always unambiguously match that representation. Because Chilean children do not

have access to the adult I-language but must rely solely on the adult E-language for constructing their own grammars, they may initially construct and grammar that does not associate the plural morpheme to an interpretation of 'more than one'.

## 6.4    Future Research

I have presented the view that variable input involving omission causes a delay in the acquisition of grammatical morphemes that are affected by that variation and I have used the acquisition of plural morphology in Chilean and Mexican Spanish to investigate and provide support for this view. While the experimental studies presented in this dissertation provide support for such a delay, there are a number of questions still remaining. It is essential that we look at much younger Chilean and Mexican children in order to examine more closely differences in production between the two groups of children. For example, it appears that 2-year-old Madrileño Spanish-speaking children, who receive unambiguous input for plural morphology, initially place the plural morpheme only on nouns and not on determiners. Would this be true for Chilean Spanish-speaking children who are exposed to an input where the plural morpheme is placed more often on the determiner and omitted more often on the noun? Moreover, would Chilean children rely more on the determiner than on the noun when assigning number to determiner phrases? Another important question has to do with verbal morphology. It has been reported that English-speaking children have difficulty using verbal morphology to assign number to subject determiner phrases. However, given that verbal morphology is unambiguous in Chilean Spanish while nominal morphology is ambiguous, would Chilean children rely on verbal morphology to assign number to subjects DPs? Miller and Schmitt (in press) provides evidence that they do. Finally, other

properties of plural morphology must be investigated in Chilean and Mexican Spanish. For example, does the omission of the plural morpheme in Chilean Spanish affect children's ability to use plural morphology to distinguish between count vs. mass nouns. We plan to investigate such questions about Chilean Spanish in future research.

It is also important to investigate how variable input involving omission might affect other areas of the grammar in various languages. Johnson (2005) has looked at child comprehension of the third person singular marking in African American Vernacular English-speaking children and found that variable input involving omission appears to delay the comprehension of the third person singular marker, which is consistent with the Variability Delay Hypothesis. Another area of interest would be the acquisition of auxiliaries in English-speaking children who are exposed to a variety of English where adults often omit the auxiliary in their own speech (see Chapter 3). These types of studies will ultimately tell us more about the validity of the Variability Delay Hypothesis. Thus, building on this research in Chilean Spanish and Mexican Spanish and investigating the acquisition of other areas of the grammar which are affected by variable input involving omission, will ultimately tell us more about how different types of input (variable vs. consistent) and the frequency of these different types of input affects language acquisition.

APPENDICES

# APPENDIX A

## Production: Study 1. Repetition Task

All children were presented with the following sentences in the same order as shown in Table 64. Sentences were accompanied by colored pictures representing each sentence.

Table 64. APPENDIX A: Study 1 Repetition Task.

Researcher: *"Este juego se llama "Escucha y Repite". ¿Tú sabes como jugar? Yo te voy a decir algo sobre el dibujo y tú tienes que repetir lo que yo digo. ¿Te parece?"* "This game is called "Listen and Repeat". Do you know how to play? I am going to say something about the pictures here and you have to repeat what I say. Do you want to play?"

PR    La niña tiene un chaleco verde.
       The girl has a green sweater.

PR    La niña tiene un chaleco azul.
       The girl has a blue sweater.

1.    Algunos bomberos están    comiendo manzanas.
       Some.PL firemen.PL are.3.PL eating     apples.PL

2.    Estoy comiendo chocolates. ¿Quieres      alguno?
       I am   eating     chocolates.PL Do you want one.SG

3.    Un       monito (chango)[22] está    comiendo una      pera.
       A/One.SG monkey.SG       is.3.SG eating     a/one.SG pear.SG

4.    Unas     bolitas          están    en la    silla.
       Some.PL marbles.PL (canicas) are.3.PL on the chair

5.    Hay       muchas galletas, ¿Quieres      alguna?
       There are many.PL cookies.PL Do you want one.SG?

6.    Algunas muñecas están     en el    piso.
       Some.PL dolls.PL    are.3.PL on the floor

7.    Un       bombero está    comiendo una      manzana.
       A/One.sg fireman.SG is.3.SG eating     a/one.SG apple.SG

8.    Algunos monitos (changos)     están    comiendo frutillas.
       Some.PL monkeys.PL         are.3.PL eating    strawberries.PL

---

[22] Words in parenthesis are those that were used with Mexican subjects due to lexical differences between the two dialects.

Table 64. APPENDIX A: Study 1 Repetition Task, cont'd.

9. Una       bolita (canica) está   en la  silla.
   A/One.SG marble.SG        is.3.SG on the chair

10. Unas    munecas están   en la  cama.
    Some.PL dolls.PL  are.3.PL on the bed

11. Un        monito (chango) está   comiendo una      frutilla.
    A/One.SG monkey.SG        is.3.SG eating     a/one.SG strawberry.SG

12. Algunas bolitas (canicas) están   en la   mesa.
    Some.PL marbles.PL        are.3.PL on the  table

13. Un        bombero está   comiendo una      papa.
    A/One.SG fireman.SG is.3.SG eating     a/one.SG potato.SG

12. Unos    monitos (changos) están   comiendo peras.
    Some.PL monkeys.PL        are.3.PL eating     pears.PL

13. Una       muñeca está   en la   cama.
    A/One.SG doll.SG   is.3.SG on the bed

14. Unos    bomberos están   comiendo papas.
    Some.PL firemen.PL are.3.PL eating       potatoes.PL

Study 2. Picture Matching Task: Indefinite Noun Phrases

All children were presented with pictures in the following order. The experimental question that accompanied each pair of pictures is shown in the box. Placement of pictures was controlled for. All pictures were in color.

Figure 19. APPENDIX B: Study 2 *Barcos* 'ships'.



¿En cuál de las dos tarjetas hay <u>unos        barcos?</u>
In which of the two cards  EXST. some.M.PL ship.M.PL
'In which of the two cards is/are there some ships?'

Figure 20. APPENDIX B: Study 2 *Monedas* 'coins'.



¿En cuál de las dos tarjetas hay <u>una       moneda?</u>
In which of the two cards  EXST. a/one.F.SG coin.F.SG
'In which of the two cards is/are there one coin?'

Figure 21. APPENDIX B: Study 2 *Botellas* 'bottles'.
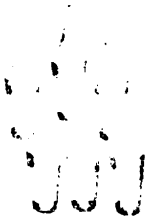


¿En cuál de las dos tarjetas hay <u>unas</u>     <u>botellas</u>?
In which of the two cards  EXST. some.F.PL bottle.F.PL
'In which of the two cards is/are there some bottles?'

Figure 22. APPENDIX B: Study 2 *Monos* (*Changos* for Mexico City) 'monkeys'.



¿En cuál  de las dos tarjetas hay  <u>un</u>     <u>mono</u>?
In which of the two cards EXST. a/one.M.SG monkey.M.SG
'In which of the two cards is/are there a/one monkey?'

Figure 23. APPENDIX B: Study 2 *Burros* 'donkeys'.

¿En cuál  de las dos tarjetas hay <u>un          burro</u>?
In which of the two cards EXST. a/one.M.SG donkey.M.SG?
'In which of the two cards is/are there a/one donkey?'

Figure 24. APPENDIX B: Study 2 *Martillos* 'hammers'.

¿En cuál de las dos tarjetas hay <u>unos      martillos</u>?
In which of the two cards EXST. some.M.PL hammer.M.PL
'In which of the two cards is/are there some hammers?'

Figure 25. APPENDIX B: Study 2 *Bolitas* (*Canicas* in Mexico City) 'marbles'.



¿En cuál de las dos tarjetas hay <u>una       bolita</u>?
  In which of the two cards EXST. a/one.F.SG marble.F.SG
  'In which of the two cards is/are there a/one marble?'
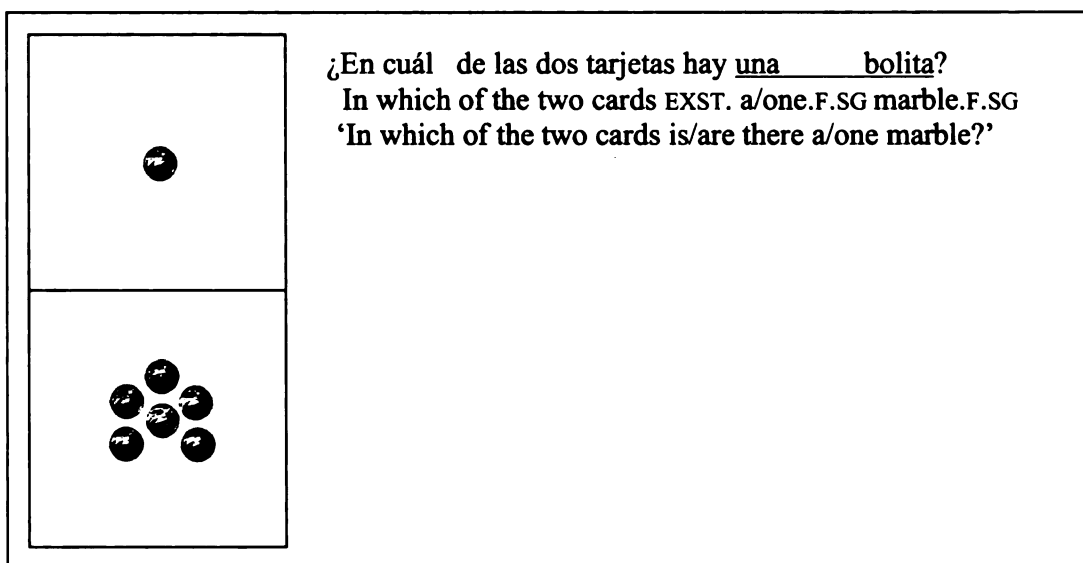
Figure 26. APPENDIX B: Study 2 *Manzanas* 'apples'.
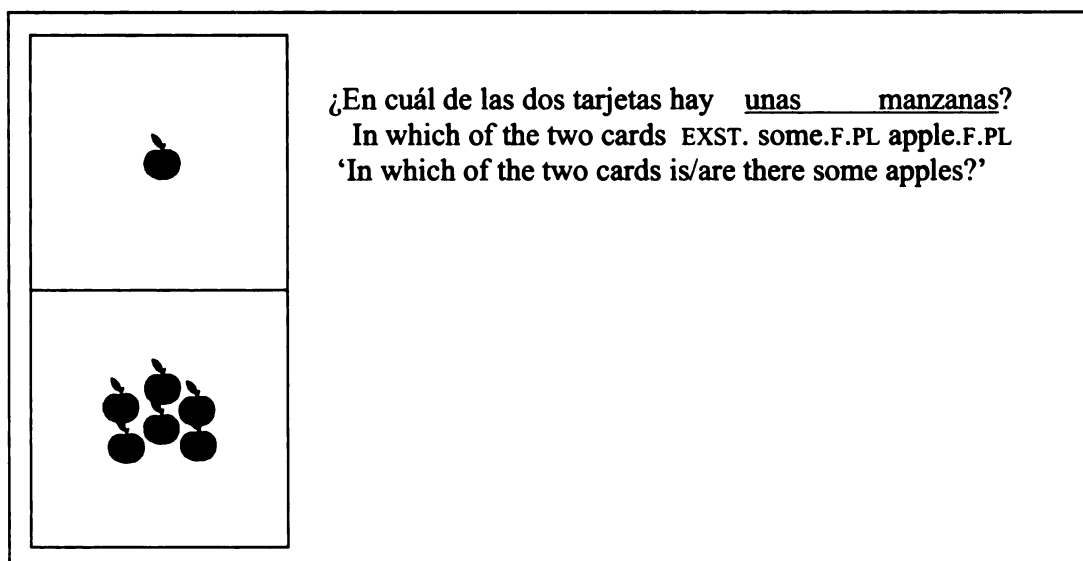


¿En cuál de las dos tarjetas hay   <u>unas       manzanas</u>?
  In which of the two cards EXST. some.F.PL apple.F.PL
  'In which of the two cards is/are there some apples?'

Study 3. Picture Matching Task: Indefinite Noun Phrases

All children were presented with pictures in the following order. The experimental question that accompanied each pair of pictures is shown in the box. All pictures were in color.

Figure 27. APPENDIX C: Study 3 Target Story: Introduction to Characters.



*Estos niños son muy buenos amigos. Un día decidieron salir de paseo. ¿A ver, ¿a dónde fueron?* These boys are very good friends. One day they decided to go for a walk. Let's see, where did they go?

Figure 28. APPENDIX C: Study 3 Target Story: Narrative 1.
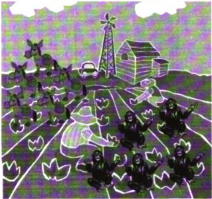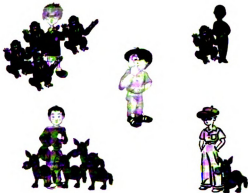


*Primero los niños fueron a mirar a los animals que había en el campo. Había _____ y _____. Así es que los niños jugaron con los animales. A ver, veamos que tiene cada niño.*
First the boys went to see the animals that were in the countryside. There were _____ y _____. So the boys played with the animals. Let's see what each boy has.



*¿Cuál niño tiene unos monos?*
Which boy has some.PL monkey.PL
'Which boy has some monkeys?'

*¿Cuál niño no tiene nada?*
Which boy NEG has nothing
'Which boy doesn't have anything?'

*¿Cuál niño tiene unos burros?*
Which boy has some.PL donkey.PL
'Which boy has some donkeys?'

Figure 29. APPENDIX C: Study 3 Target Story: Narrative 2.
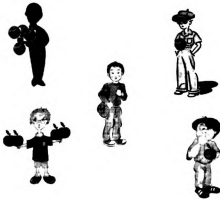


*Después fueron a conocer una tienda de juguetes. A ver, en esa tienda había _____ y _____. Los niños se compraron varias cosas. A ver, veamos que tiene cada niño.*
Next, they went to a toy store. Let's see, in this store there were _____ and _____. The children bought several things. Let's se what each boy has.



*¿Cuál niño tiene una      bolita?*
Which boy has a/one.SG  marble.SG
'Which boy has a/one marble?'

*¿Cuál niño no   tiene nada?*
Which boy NEG has  nothing
'Which boy doesn't have anything?'

*¿Cuál niño tiene una      manzana?*
Which boy has  an/one.SG apple.SG
'Which boy has an/one apple?'

Figure 30. APPENDIX C: Study 3 Target Story: Narrative 3.



*Después de jugar se quedaron muy cansados así es que fueron a la casa de la abuela. La abuela tenía muchas cosas interesantes en su casa. Había _____ y _____. La abuela siempre les regalaba cosas a los niños. A ver, veamos que tiene cada niño.* After playing the boys were very tired so they went to their grandma's house. The grandma had lots of interesting things in her house. There were _____ and _____. Let's see what each boy has.



*¿Cuál niño tiene unas       monedas?*
Which boy has  some.PL coins.PL
'Which boy has some coins?'

*¿Cuál niño no  tiene nada?*
Which boy NEG has   nothing
'Which boy doesn't have anything?'

*¿Cuál niño tiene unas       botellas?*
Which boy has  some.PL bottle.PL
'Which boy has some bottles?'

Figure 31. APPENDIX C: Study 3 Target Story: Narrative 4.
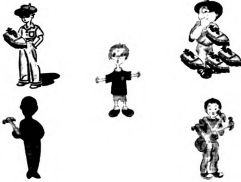


*Después se fueron a la tienda. Allí en la tienda había varias coasas. Había _____ y _____. Los niños compraron varias cosas. A ver, veamos que tiene cada niño.* Afterwards, the boys went to the store. There, in the store there were lots of things. There were _____ and _____. The boys bought several things. Let's see what each boy has.



*¿Cuál niño tiene un     martillo?*
Which boy has   a/one.SG hammer.SG
'Which boy has a/one hammer?'

*¿Cuál niño no   tiene nada?*
Which boy NEG has   nothing
'Which boy doesn't have anything?'

*¿Cuál niño tiene un     barco?*
Which boy has   a/one.SG ship.SG
'Which boy has a/one ship?'

Figure 32. APPENDIX C: Study 3 Control Story: Introduction to Characters.



*Estas niñas son muy buenas amigas. Un día decidieron salir de paseo. ¿A ver, ¿a dónde fueron?* These girls are very good friends. One day they decided to go for a walk. Let's see, where did they go?

Figure 33. APPENDIX C: Study 3 Control Story: Narrative 1.
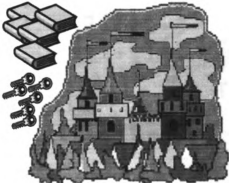


*Primero, fueron a conocer un castillo enorme porque en ese castillo había cosas muy interesantes. A ver, había _____ y _____. Al salir del castillo las niñas se llevaron algunas cosas. A ver, veamos que tiene cada niña.* First, they went to visit a big castle because in this castle there were many interesting things. Let's see, there were _____ and _____. Upon leaving the castle the girls took some things. Let's see what each girl has.

*¿Cuál niña tiene un solo libro?*
Which girl has one only book
'Which girl has only one book?'

*¿Cuál niña no tiene nada?*
Which girl NEG has nothing
'Which girl doesn't have anything?'

*¿Cuál niña tiene una sola llave?*
Which girl has one only key?
'Which girl has only one key?'

Figure 34. APPENDIX C: Study 3 Control Story: Narrative 2.



*Después se fueron a la playa. Para ir a la playa es bueno traer algunas cosas, como por ejemplo _____ y _____. Las niñas trajeron muchas cosas a la playa. A ver, veamos que tiene cada niña.* Next, they went to the beach. When you go to the beach it is a good idea to bring some things along, like _____ and _____. Let's see what each girl has.

*¿Cuál niña tiene muchas pelotas?*
Which girl has   many   balls
'Which girl has many balls?'

*¿Cuál niña no  tiene nada?*
Which girl NEG has   nothing
'Which girl doesn't have anything?'

*¿Cuál niña tiene muchas toallas?*
Which girl has   many   towels?
'Which girl has many towels?'

Figure 35. APPENDIX C: Study 3 Control Story: Narrative 3.
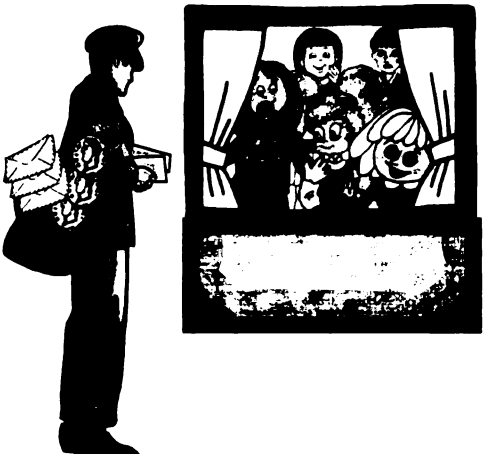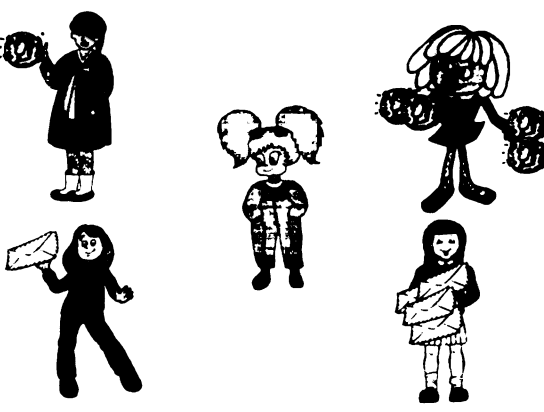


*Después de ir a la playa, estuvieron muy cansadas así es que fueron a la casa para descansar. Al llegar a la casa, justo llegó el cartero y traía _____ y _____ para las niñas. A ver, veamos que tiene cada niña.* After going to the beach, the girls were very tired so they went home to rest. When they got home, the postman came and brought _____ y _____ for the girls. Let's see what each girl has.

*¿Cuál niña tiene una sola moneda?*
Which girl has    one only coin
'Which girl has only one coin?'

*¿Cuál niña no    tiene nada?*
Which girl NEG has   nothing
'Which girl doesn't have anything?'

*¿Cuál niña tiene una sola carta?*
Which girl has    one only letter?
'Which girl has only one letter?'

Figure 36. APPENDIX C: Study 3 Control Story: Narrative 4.



*Al final, las niñas fueron a mirar a los animals que había en una tienda de mascotas. Había _____ y _____. Así es que las niñas compraron algunas mascotas. A ver, veamos que tiene cada niña.* Finally, the girls went to look at the animals in the pet shop. There were _____ y _____. Let's see what each girl has.



*¿Cuál niña tiene muchos gatos?*
Which girl has   many   cats
'Which girl has many cats?'

*¿Cuál niña no   tiene nada?*
Which girl NEG has   nothing
'Which girl doesn't have anything?'

*¿Cuál niña tiene muchos perros?*
Which girl has   many   dogs
'Which girl has many dogs?'

Study 4. Elicitation Task: Bare Nouns and Indefinite Noun Phrases

All children were presented with pictures in the following order. The experimental question that accompanied each picture is shown in the box. All pictures were in color.

Figure 37. APPENDIX D: Study 4 Elicitation Task.
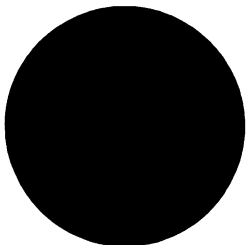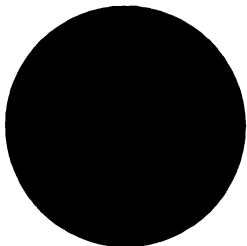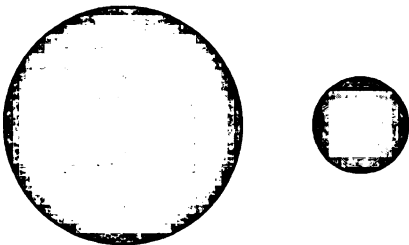
| | |
|---|---|
|  | Researcher: *Mira. ¿Qué es? ¿Y, de qué color es? ¿Es azul o rojo? Look. What's this?* And, what color is it (red circle)? Is it blue or red? |
|  | Researcher: *Mira. ¿Qué es? ¿Y, de qué color es? ¿Es azul o rojo? Look. What's this?* And, what color is it (blue circle)? Is it blue or red? |
|  | Researcher: *Mira. Aquí hay dos círculos. ¿Cuál circulo es más grande? ¿Cuál círculo es más chico?* Look. Here are two circles. Which circle is bigger? Which circle is smaller? |

Figure 37. APPENDIX D: Study 4 Elicitation Task, cont'd.

| | |
|---|---|
|  | Researcher: ¿*Qué hay aquí?* What's here? |
|  | Researcher: ¿*Qué hay aquí?* What's here? |
|  | Researcher: ¿*Qué hay aquí?* What's here? |
|  | Researcher: ¿*Qué hay aquí?* What's here? |

Figure 37. APPENDIX D: Study 4 Elicitation Task, cont'd.

| | Researcher: *¿Qué hay aquí?* What's here? |
|---|---|
|  | |
|  | Researcher: *¿Qué hay aquí?* What's here? |
|  | Researcher: *¿Qué hay aquí?* What's here? |
|  | Researcher: *¿Qué hay aquí?* What's here? |

Figure 37. APPENDIX D: Study 4 Elicitation Task, cont'd.

| | Researcher: *¿Qué hay aquí?* What's here? |
|---|---|
| | Researcher: *¿Qué hay aquí?* What's here? |
| | Researcher: *¿Qué hay aquí?* What's here? |
| | Researcher: *¿Qué hay aquí?* What's here? |

Figure 37. APPENDIX D: Study 4 Elicitation Task, cont'd.

| | Researcher: *¿Qué hay aquí?* What's here? |
|---|---|
| | Researcher: *¿Qué hay aquí?* What's here? |
| | Researcher: *¿Qué hay aquí?* What's here? |
| | Researcher: *¿Qué hay aquí?* What's here? |

Study 5. Picture Matching Task: Bare Noun Phrases

All children were presented with pictures in the following order. The experimental question that accompanied each pair of pictures is shown in the box. Placement of pictures was controlled for. All pictures were in color.

Figure 38. APPENDIX E: Study 5 Target Story: Introduction to Characters.



*Estas niñas son muy buenas amigas. Un día decidieron salir de paseo. ¿A ver, ¿a dónde fueron?* These girls are very good friends. One day they decided to go for a walk. Let's see, where did they go?
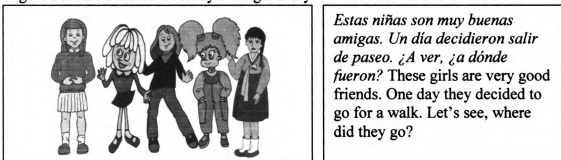
Figure 39. APPENDIX E: Study 5 Target Story: Narrative 1.
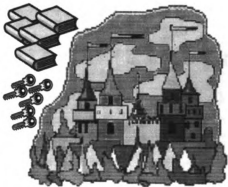


*Primero, fueron a conocer un castillo enorme porque en ese castillo había cosas muy interesantes. A ver, había _____ y _____. Al salir del castillo las niñas se llevaron algunas cosas. A ver, veamos que tiene cada niña.* First, they went to visit a big castle because in this castle there were many interesting things. Let's see, there were _____ and _____. Upon leaving the castle the girls took some things. Let's see what each

*¿Cuál niña tiene libros?*
Which girl has books
'Which girl has books?'

*¿Cuál niña no tiene nada?*
Which girl NEG has nothing
'Which girl doesn't have anything?'

*¿Cuál niña tiene llaves?*
Which girl has keys?
'Which girl has keys?'

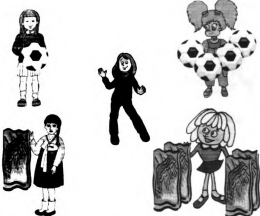Figure 40. APPENDIX E: Study 5 Target Story: Narrative 2.



*Después se fueron a la playa. Para ir a la playa es bueno traer algunas cosas, como por ejemplo _____ y _____. Las niñas trajeron muchas cosas a la playa. A ver, veamos que tiene cada niña.* Next, they went to the beach. When you go to the beach it is a good idea to bring some things along, like _____ and _____. Let's see what each girl has.



*¿Cuál niña tiene pelota?*
Which girl has   ball
'Which girl has (a) ball?'

*¿Cuál niña no   tiene nada?*
Which girl NEG has   nothing
'Which girl doesn't have anything?'

*¿Cuál niña tiene toalla?*
Which girl has    towel
'Which girl has (a) towel?'

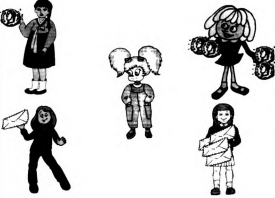Figure 41. APPENDIX E: Study 5 Target Story: Narrative 3.



*Después de ir a la playa, estuvieron muy cansadas así es que fueron a la casa para descansar. Al llegar a la casa, justo llegó el cartero y traía _____ y _____ para las niñas. A ver, veamos que tiene cada niña.*
After going to the beach, the girls were very tired so they went home to rest. When they got home, the postman came and brought _____ y _____ for the girls. Let's see what each girl has.

*¿Cuál niña tiene monedas?*
Which girl has   coins
'Which girl has  coins?'

*¿Cuál niña no   tiene nada?*
Which girl NEG has   nothing
'Which girl doesn't have anything?'

*¿Cuál niña tiene cartas?*
Which girl has   letters?
'Which girl has  letters?'

300

Figure 42. APPENDIX E: Study 5 Target Story: Narrative 4.



*Al final, las niñas fueron a mirar a los animals que había en una tienda de mascotas. Había _____ y _____. Así es que las niñas compraron algunas mascotas. A ver, veamos que tiene cada niña.* Finally, the girls went to look at the animals in the pet shop. There were _____ y _____. Let's see what each girl has.



*¿Cuál niña tiene gato?*
Which girl has   cat
'Which girl has (a) cat?'

*¿Cuál niña no   tiene nada?*
Which girl NEG has   nothing
'Which girl doesn't have anything?'

*¿Cuál niña tiene perro?*
Which girl has   dog?
'Which girl has (a) dog?'

Figure 43. APPENDIX E: Study 5 Control Story: Introduction to Characters.



*Estos niños son muy buenos amigos. Un día decidieron salir de paseo. ¿A ver, ¿a dónde fueron?* These are very good friends. One day they decided to go for a walk. Let's see, where did they go?

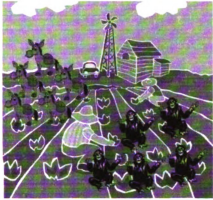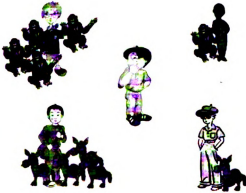Figure 44. APPENDIX E: Study 5 Control Story: Narrative 1.



*Primero los niños fueron a mirar a
los animals que había en el campo.
Había _____ y _____. Así es que
los niños jugaron con los animales.
A ver, veamos que tiene cada niño.*
First the boys went to see the
animals that were in the
countryside. There were _____ y
_____. So the boys played with the
animals. Let's see what each boy
has.



*¿Cuál niño tiene muchos monos?*
Which boy has  many    monkeys
'Which boy has many monkeys?'

*¿Cuál niño no  tiene nada?*
Which boy NEG has   nothing
'Which boy doesn't have anything?'

*¿Cuál niño tiene muchos    burros?*
Which boy has  many        donkeys
'Which boy has many donkeys?'

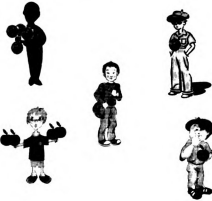Figure 45. APPENDIX E: Study 5 Control Story: Narrative 2.



*Después fueron a conocer una tienda de juguetes. A ver, en esa tienda había _____ y _____. Los niños se compraron varias cosas. A ver, veamos que tiene cada niño.*
Next, they went to a toy store. Let's see, in this store there were _____ and _____. The children bought several things. Let's se what each boy has.

*¿Cuál niño tiene una sola bolita?*
Which boy has only one marble
'Which boy has only one marble?'

*¿Cuál niño no tiene nada?*
Which boy NEG has nothing
'Which boy doesn't have anything?'

*¿Cuál niño tiene una sola manzana?*
Which boy has only one apple
'Which boy has only one apple?'

Figure 46. APPENDIX E: Study 5 Control Story: Narrative 3.



*Después de jugar se quedaron muy cansados así es que fueron a la casa de la abuela. La abuela tenía muchas cosas interesantes en su casa. Había _____ y _____. La abuela siempre les regalaba cosas a los niños. A ver, veamos que tiene cada niño.* After playing the boys were very tired so they went to their grandma's house. The grandma had lots of interesting things in her house. There were _____ and _____. Let's see what each boy has.

*¿Cuál niño tiene muchas monedas?*
Which boy has    many   coins
'Which boy has many coins?'

*¿Cuál niño no   tiene nada?*
Which boy NEG has   nothing
'Which boy doesn't have anything?'

*¿Cuál niño tiene muchas botellas?*
Which boy has   many    bottles
'Which boy has many bottles?'

Figure 47. APPENDIX E: Study 5 Target Story: Narrative 4.



*Despúes se fueron a la tienda. Allí en la tienda había varias coasas. Había _____ y _____. Los niños compraron varias cosas. A ver, veamos que tiene cada niño.*
Afterwards, the boys went to the store. There, in the store there were lots of things. There were _____ and _____. The boys bought several things. Let's see what each boy has.



*¿Cuál niño tiene un solo martillo?*
Which boy has only one hammer
'Which boy has only one hammer?'

*¿Cuál niño no tiene nada?*
Which boy NEG has nothing
'Which boy doesn't have anything?'

*¿Cuál niño tiene un solo barco?*
Which boy has only one ship
'Which boy has only one ship?'

# APPENDIX F

## Study 6. Act-out Task: Definites in Inalienable Possession

All children were presented with sentences in the following order.

Table 65. APPENDIX F: Study 6 Act-out Task.

Researcher: *Mira. Este es Carlita* (Show female doll). *Yo te voy a decir lo que tienes que hacer con Carlita y tu tienes que hacerlo. ¿Entiendes?* Look. This is Carlita. I am going to tell you what you have to do with Carlita and you have to do it. Understand?

1  Levántale la      pierna
   Lift.her   the.F.SG leg.F.SG
   'Lift her leg'

Control Dame la vaca
   Give.me the.F.SG cow.F.SG
   'Give me the cow'

2  Tírale   la      oreja
   Pull.her the.F.SG ear.F.SG
   'Pull her ear'

3  Tócale   la      rodilla
   Touch.her the.F.SG knee.F.SG
   'Touch her knee'

Control Dame   la      araña
   Give.me the.F.SG spider.F.SG
   'Give me the spider'

4  Levántale la      mano
   Lift.her   the.F.SG hand.F.SG
   'Lift her hand'

Table 65. APPENDIX F: Study 6 Act-out Task, cont'd.

Researcher: *Mira. Este es Pedro (Show male doll). Yo te voy a decir lo que tienes que hacer con Pedro y tu tienes que hacerlo. ¿Entiendes?* Look. This is Pedro. I am going to tell you what you have to do with Pedro and you have to do it. Understand?

5.      Levántale las     piernas
         Lift.him   the.F.PL legs.F.PL
         'Lift his legs'

Control  Dame las vacas
         Give.me the.F.PL cows.F.PL
         'Give me the cows'

6.      Tírale    las      orejas
         Pull.him the.F.PL  ears.F.PL
         'Pull his ears'

7.      Tócale    las     rodillas
         Touch.him the.F.PL knees.F.PL
         'Touch his knees'

Control  Dame   las    arañas
         Give.me the.F.PL spiders.F.PL
         'Give me the spiders'

8.      Levántale las     manos
         Lift.him   the.F.PL hands.F.PL
         'Lift his hands'

## Study 7. Act-out Task: Definite Noun Phrases

All children were presented with sentences in the following order.

Table 66. APPENDIX G: Study 7 Act-out Task.

| | | |
|---|---|---|
| 1 | Dame todas las vacas durmiendo al lado de la casa.<br>Give.me all.PL the.PL cows.PL sleeping next to the house<br>'Give me all of the cows sleeping next to the house.' | Control-all |
| 2 | Dame las vacas durmiendo al lado de la granja.<br>Give.me the.PL cows.PL sleeping next to the barn<br>'Give me the cows sleeping next to the barn.' | Target-Def.Pl |
| | Return cows to original positions. | |
| 3 | ¿Crees que las vacas comen pasto?<br>Think.2.SG that the.PL cows.PL eat.3.PL grass?<br>'Do you think that cows eat grass?' | Filler-Distractor |
| 4 | ¿Son grandes o pequeñas las vacas?<br>Are.3.PL big.PL or small.PL the.PL cows.PL<br>'Are cows big or small?' | Filler-Distractor |
| 5 | Dame unas vacas durmiendo al lado de la casa.<br>Give.me some.PL cows.PL sleeping next to the house<br>'Give me some cows sleeping next to the house.' | Target-Indef.Pl |
| 6 | Dame la vaca durmiendo al lado de la granja.<br>Give.me the.SG cow.SG sleeping next to the barn<br>'Give me the cow sleeping next to the barn.' | Target-Def.Sg |
| | Return cows to original positions. | |
| 7 | Dame una vaca durmiendo al lado de la granja.<br>Give.me a/one.SG cow.SG sleeping next to the barn<br>'Give me a/one cow sleeping next to the barn.' | Control-one |
| | Take away cows and replace with spiders. | |
| 8 | Dame una araña durmiendo al lado de la granja.<br>Give.me a/one.SG spider.SG sleeping next to the barn<br>'Give me a/one spider sleeping next to the barn.' | Control-one |

Table 66. APPENDIX G: Study 7 Act-out Task, cont'd.

| | | |
|---|---|---|
| 9 | Dame todas las arañas durmiendo al lado de la casa.<br>Give.me all.PL the.PL spiders.PL sleeping next to the house<br>'Give me all of the spiders sleeping next to the house.' | Control-all |
| | Return spiders to original positions. | |
| 10 | ¿Has visto alguna vez una tela de arañas?<br>Have.2.SG seen some time a web of spiders.PL<br>'Have you seen a spider web before?' | Filler-Distractor |
| 11 | ¿Qué comen las arañas?<br>What eat.3.PL the.PL spiders.PL<br>'What do spiders eat?' | Filler-Distractor |
| 12 | Dame unas arañas durmiendo al lado de la granja.<br>Give.me some.PL spiders.PL sleeping next to the barn<br>'Give me some spiders sleeping next to the barn.' | Target-Indef.Pl |
| 13 | Dame la araña durmiendo al lado de la casa.<br>Give.me the.SG spider.SG sleeping next to the house<br>'Give me the spider sleeping next to the house.' | Target-Def.Sg |
| | Return spiders to original positions. | |
| 14 | Dame las arañas durmiendo al lado de la granja.<br>Give.me the.PL spiders.PL sleeping next to the barn<br>'Give me the spiders sleeping next to the barn.' | Target-Def.Pl |
| | Take away spiders and replace with dolls. | |
| 15 | Dame las muñecas durmiendo al lado de la casa<br>Give.me the.PL dolls.PL sleeping next to the house<br>'Give me the dolls sleeping next to the house.' | Target-Def.Pl |
| 16 | Dame la muñeca durmiendo al lado de la granja<br>Give.me the.SG doll.SG sleeping next to the barn<br>'Give me the doll sleeping next to the barn.' | Target-Def.Sg |
| | Return dolls to original positions. | |

Table 66. APPENDIX G: Study 7 Act-out Task, cont'd.

| | | |
|---|---|---|
| 17 | ¿Te gustan estas muñecas?<br>You please.3.PL these.PL dolls.PL<br>'Do you like these dolls?' | Filler-Distractor |
| 18 | ¿De que color es su ropa?<br>Of what color is.3.SG their clothes<br>'What color are their clothes?' | Filler-Distractor |
| 19 | Dame unas muñecas durmiendo al lado de la granja.<br>Give.me some.PL dolls.PL sleeping next to the barn<br>'Give me some dolls sleeping next to the barn.' | Target-Indef.Pl |
| 20 | Dame una muñeca durmiendo al lado de la casa.<br>Give.me a/one.SG doll.SG sleeping next to the house<br>'Give me a/one doll sleeping next to the house.' | Control-one |

Return dolls to original positions.

| | | |
|---|---|---|
| 21 | Dame todas las muñecas durmiendo al lado de la casa.<br>Give.me all.PL the.PL dolls.PL sleeping next to the house<br>'Give me all of the dolls sleeping next to the house.' | Control-all |

Take away dolls and replace with ants.

| | | |
|---|---|---|
| 22 | Dame la hormiga durmiendo al lado de la granja.<br>Give.me the.sg ant.sg sleeping next to the barn<br>'Give me the ant sleeping next to the barn.' | Target-Def.Sg |
| 23 | Dame una hormiga durmiendo al lado de la casa.<br>Give.me a/one ant sleeping next to the house<br>'Give me a/one ant sleeping next to the house.' | Control-one |

Return ants to original positions.

| | | |
|---|---|---|
| 24 | ¿Saben las hormigas hablar?<br>Know.3.PL the.PL ants.PL speak.NONFIN<br>'Do ants know how to speak?' | Filler-Distractor |
| 25 | ¿Son grandes o pequeñas las hormigas?<br>Are.3.PL big.PL or small.PL the.PL ants.PL<br>'Are ants big or small?' | Filler-Distractor |

Table 66. APPENDIX G: Study 7 Act-out Task, cont'd.

| 26 | Dame unas hormigas durmiendo al lado de la casa.<br>Give.me some.pl ants.pl sleeping next to the house<br>'Give me some ants sleeping next to the house.' | Target-Indef.Pl |
|---|---|---|
| 27 | Dame todas las hormigas durmiendo al lado de la granja.<br>Give.me all.PL the.PL ants.PL sleeping next to the barn<br>'Give me all of the ants sleeping next to the barn.' | Control-all |
| | Return ants to original positions. | |
| 28 | Dame las hormigas durmiendo al lado de la casa.<br>Give.me the.PL ants.PL sleeping next to the house<br>'Give me the ants sleeping next to the house.' | Target-Def.Pl |

# BIBLIOGRAPHY

# BIBLIOGRAPHY

Alonso A., and Lida, R. (1940). El español de Chile. Buenos Aires: Biblioteca de Dialectología de Buenos Aires.

Barner, D., and Snedeker, J. (2005). Quantity judgments and individuation: evidence that mass nouns count. *Cognition* 97: 41-66.

Barrutia R., and Schwegler, A. (1994). Fonética y Fonología Españolas: Teoria y Práctica. New York: Wiley and Sons.

Bedore L., and Leonard, L. (2001). Grammatical Morphology Deficits in Spanish-speaking Children with Specific Language Impairment. *Journal of Speech, Hearing and Language Research* 44: 905-924.

Berko, J. (1958). The child's learning of English morphology. *Word* 14:150-177.

Berman, R. (1981). Language development and language knowledge: evidence from the acquisition of Hebrew morphophonology. *Journal of Child Language* 8: 609-626.

Bosque, I. (1996). *El Sustantivo Sin Determinación. La Ausencia de Determinación en la Lengua Española*. Madrid: Visor Libros.

Bradley, T. (2006). Spanish Rhotics and Dominican Hypercorrect /s/. *Probus* 18, (1): 1-33.

Brown, R. (1973). *A first language: the early stages*. Cambridge, Mass.: Harvard University Press.

Canfield, D. (1982). Spanish Pronunciation in the Americas. *The Modern Language Journal* 66, (3): 350-351.

Cantú-Sánchez, M., and Grinstead, J. (2004). Nominal number and gender agreement in child Spanish SLI. Poster presented at *Generative Approaches to Language Acquisition in North America (GALANA)*, December 19, University of Hawai'i at Manoa.

Carlson, G. (1977). *Reference to Kinds in English*. University of Massachusetts, Amherst Dissertation, [Published 1980 New York: Garland Press.].

Cazden, C. (1968). The Acquisition of Noun and Verb Inflections. *Child Development* 39: 433-448.

314

Cepeda, G. (1995). Retention and Deletion of Word-final /s/ in Valdivian Spanish (CHILE). *Hispanic Linguistics* 6/7: 329-353.

Chomsky, N. (1986). *Knowledge of Language. It's Nature, Origin and Use.* Praeger Press.

---- (1995). *The Minimalist Program.* The Massachusetts Institute of Technology Press.

Chierchia, G. (1998). Reference to Kinds Across Languages. *Natural Language Semantics* 6: 339-405.

de Villiers, J., and de Villiers, P. (1973). A cross sectional study of the acquisition of grammatical morphemes in child speech. *Journal of Psycholinguistic Research* 2: 267-278.

de Villiers, P., and de Villiers, J. (2004). Assessing Pragmatics: Who, What and How? Paper presented at the *American Speech-Language-Hearing Association* (ASHA) Convention.

Díaz Campos, M. (2005). The emergence of adult-like command of sociolinguistic variables: A study of consonant weakening in Spanish-speaking children. In D. Eddington (ed.), *Studies in the Acquisition of the Hispanic Languages: Papers from the 6th Conference on the Acquisition of Spanish and Portuguese as First and Second Languages.* Somerville, MA: Cascadilla Press: 56-65.

Haeussler, I., and Marchant, T. (1988). *Test de Desarrollo Psicomotor 2-5 años TEPSI.* Santiago, Chile: Universidad Católica de Chile Press.

Hudson Kam, C., and Newport, E. (2005). Regularizing unpredictable variation: The roles of adult and child learners in language formation and change. *Language Learning and Development* 1: 151-195.

Fasold, R., and Wolfram, W. (1970). Some linguistic features of Negro dialect. In R. Fasold and R. Shuy (eds.), *Teaching Standard English in the Inner City.* Washington, DC: Center for Applied Linguistics: 41-86.

Ferenz, K., and Prasada, S. (2002). Singular or plural? Children's knowledge of the factors that determine the appropriate form of count nouns. *Journal of Child Language* 29: 49-70.

Gathercole, V. (1986). The acquisition of the present perfect: explaining differences in the speech of Scottish and American children. *Journal of Child Language* 13: 537-560.

Gouvea, A., Aldana, G., Bell, T., Cody, K., de Groat, C., Johnson, C., McCabe, D., Zimmerman, L., and Kim, J. (2005). 18 Month Old Infants' Sensitivity to Number

Agreement Inside the Noun Phrase. In: A. Brugos. M. Clark-Cotton, and S. Ha (eds.), *BUCLD 29: Proceedings of the 29th annual Boston University Conference on Language Development.* Cascadilla Press: 240-247.

Grimshaw, J. (1991). *Extended projection.* Ms., Brandeis University, Waltham, Mass.

Guy, G. (1980). Variation in the group and the individual: The case of final stop deletion. In W. Labov (ed.), *Locating language in time and space.* New York: Academic Press: 1-36.

Guasti M. and Rizzi, L. (2002). Agreement and tense as distinct syntactic positions: Evidence from acquisition. In G. Cinque (ed.), *Functional structure in DP and IP: The cartography of syntactic structures* 1, Oxford University Press.

Pavez, M. (2003). *Test Exploratorio de Grámatica Española de A. Toronto: Aplicación en Chile.* Santiago, Chile: Universidad Católica de Chile Press.

---- (2004). *Test para la Comprensión Auditiva del Lenguaje de E. Carrow.* Santiago, Chile: Alfabeta Artes Gráficas.

Johnson, V. (2005). Comprehension of Third Person Singular /s/ in AAE-Speaking Children. *Journal of Language, Speech, and Hearing Services in Schools* 36: 116-124.

Johnson, V., de Villiers, J., and Seymour, H. (2005). Agreement without understanding? The case of third person singular /s/. *First Language* 25: 317-330.

Hudson Kam, C., and Newport, E. (2005). Regularizing Unpredictable Variation: The Roles of Adult and Child Learners in Language Formation and Change. *Language Learning and Development* 1: 151-195.

Kernan, K., and Blount, B. (1966). The Acquisition of Spanish Grammar by Mexican Children. *Anthropological Linguistics* 8, (9): 1-14.

Kouider, S., Halberda, J., Wood, J., Carey, S. (2006). Acquisition of English Number Marking: the Singular-Plural Distinction. *Language Learning and Development* 2, 1: 1-25.

Kopcke, K. M. (1998). The acquisition of plural marking in English and German revisited: schemata versus rules. *Journal of Child Language* 25: 293–319.

Kovac, C. and Adamson, H.D. (1981). Variation Theory and First Language Acquisition. In: D. Sankoff and H. Cedergren (eds.), *Variation Omnibus*: 403-410.

Kroch, A. (1994). Morphosyntactic Variation. In: K. Beals et al. (eds.), *Proceedings of the Thirtieth Annual Meeting of the Chicago Linguistic Society* 2: 180 - 201.

---- (2001). Syntactic Change. In: M. Baltin and C. Collins (eds.), *Handbook of Contemporary Syntactic Theory*. Blackwell Press.

Kvaal, J., Shipstead-Cox, N., Nevitt, S.G., Hodson, B., Launer, P. (1988). The Acquisition of 10 Spanish Morphemes by Spanish-Speaking Children. *Language Speech, and Hearing Services in Schools* 19: 384-394.

Kupisch, T. (2006). The acquisition of determiners in bilingual German-Italian and German-French children. LINCOM Studies in Language Acquisition 17.

Labov, W. (1989). The child as linguistic historian. Language Variation and Change. 1(1): 85-98.

Lenz, R. (1940). *El español en Chile*. Buenos Aires: Biblioteca de Dialectología Hispanoamericana, Instituto de Filología de la Universidad de Buenos Aires.

Lillo-Martin, D., and Snyder W. (2002). Cross-linguistic study of early syntax. Proceedings of the *IV Congresso Internacional de Lingua e Literatura de Mercosul*, Universidade Luterano do Brasil: 1-10.

Lipski, J. (1985). /s/ in Central American Spanish. *Hispania* 68: 143-9.

---- (1986). Reduction of /s/ and /n/ in Spanish. *Canadian Journal of Linguistics* 31: 139-56.

---- (1999). The many faces of Spanish /s/-weakening: (re)alignment and ambisyllabicity. In: J. Gutiérrez-Rexach and F. Martínez-Gil (eds.), *Advances in Hispanic linguistics* Somerville, MA: Cascadilla Press: 198-213.

---- (1994). *Latin American Spanish*. London: Longmann.

Marrero, V., and Aguirre, C. (2003). Plural acquisition and development in Spanish. In: S. Montrul and F. Ordóñez (eds.), *Linguistic Theory and Language Development in Hispanic Languages*. Somerville, Cascadilla Press, 275-296.

Masullo, P. (1992). *Incorporation and Case Theory in Spanish: A crosslinguistic perspective*. University of Washington Doctoral Dissertation.

Mervis, C., and Johnson, K. (1991). Acquisition of the plural morpheme: a case study. *Developmental Psychology* 27 (2): 222-235.

Miller, K., and Schmitt, C. (2004). An Experimental Study on Child Comprehension of Spanish Indefinites and Bare Singulars. *Language Acquisition: A Journal of Developmental Linguistics* 12 (3/4): 247-256.

Miller, K., and Schmitt, C. (in press). Variable vs. Consistent Input: Comprehension of Plural Morphology and Verbal Agreement in Children.

Munn, A., Miller, K., Schmitt, C. (2006). Plurality and Maximality in Children's Comprehension of Definite Noun Phrases. In: D. Bamman, T. Magnitskaia, and C. Zaller (eds.), *BUCLD 30: Proceedings of the 30th annual Boston University Conference on Language Development*, Somerville, Mass.: Cascadilla Press: 365-376.

Moore, M. (1979). *Acquisition of plural inflection by black American children*. Michigan State University Doctoral Dissertation.

Moreno de Alba, J. (1994). *La pronunciacion del español en Mexico* (Estudios de Dialectología Mexicana, V). Santa Teresa, Mexico: El Colegio de Mexico.

Morgan, T. (1998). The linguistic parameters of /s/ insertion in Dominican Spanish: A case study in qualitative hypercorrection. *Perspectives on Spanish Linguistics* 3: 79-96.

Ojeda, A. (1998). The Semantics of Collectives and Distributives in Papago. *Natural Language Semantics* 6: 245-270.

Oroz, R. (1960). La lengua castellana en Chile. Santiago, Chile: Editorial Universitaria.

Paolillo, J. (2002). *Analyzing Linguistic Variation: Statistical Models and Methods*. Standford, California: CSLI Publications.

Park, T. (1978). Plurals in Child Speech. *Journal of Child Language* 5: 237-250.

Pavez, M. (2003). *Test Exploratorio de Grámatica Española de A. Toronto: Aplicación en Chile*. Santiago, Chile: Ediciones Universidad Católica de Chile.

Pavez, M. (2004). *Test para la comprensión auditiva del lenguaje de E. Carrow: Aplicación en Chile*. Santiago, Chile: Ediciones Universidad Católica de Chile.

Pérez-Leroux, A-T. (2005). Number Problems in Children, *Proceedings of the 2005 Annual Conference of the Canadian Linguistics Association*: 1-12.

Perez-Pereira, M. (1989). The Acquisition of Morphemes: Some Evidence from Spanish. *Journal of Psycholinguistic Research* 18, (3): 289-312.

Ramer, A., and Rees, N. (1973). Selected Aspects of the Development of English Morphology in Black American Children of Low Socioeconomic Background. *Journal of Speech and Hearing Research* 16, (4): 569-577.

Rand, D., and Sankoff, D. (1990). *Goldvarb: a variable rule application for the Macintosh*. Centre de recherches mathematiques, Universite de Montreal, Canada.

318

Roberts, J. (1994). *Acquisition of Variable Rules: (-t,d) Deletion and (ing) Production in Preschool Children*. University of Pennsylvania Doctoral Dissertation.

Roberts, J. (1997). Acquisition of Variable Rules: A Study of (-t,d) Deletion in Preschool Children. *Journal of Child Language* 24, (2): 351-172.

Smith J., Durham, M., Fortune, L. (2006). Caregiver and Child in the Acquisition of Sociolinguistic Norms in a Scottish Dialect. In D. Bamman, T. Magnitskaia, and C. Zaller (eds.), *BUCLD 30: Proceedings of the 30th annual Boston University Conference on Language Development*, Somerville, Mass.: Cascadilla Press: 572-583.

Sauerland, U. (2003). A new semantics for number. *The Proceedings of SALT 13*. Cornell University, Ithaca, N.Y.: CLC-Publications.

Munn, A., and Schmitt, C. (2003). Bare nouns and the morpho-syntax of number. In: T. Satterfield, C. Tortora and D.Cresti (eds.), *Current Issues in Romance Languages: Selected papers from the 29th Linguistic Symposium on Romance Languages (LSRL)*: 225-239.

Wolfram, W., and Schilling-Estes, N. (1998). *American English: Dialects and Variation*, Oxford: Basil Blackwell.

Schwarzschild. R. (1996). *Pluralities*. Kluwer Academic Publishers.

Schutze. C. (2006). What it means (not) to know (number) agreement. Paper presented at the *GLOW Workshop: Acquisition of the Syntax and Semantics of Number Marking*.

Seymour, H., and Pearson, B. (2004). Evaluating language variation: Distinguishing development and dialect from disorder. Special issue of *Seminars in Speech and Language*, New York: Thieme Medical Publishers.

Singleton, J., and Newport, E. (2004). When learners surpass their models: The acquisition of American Sign Language from inconsistent input. *Cognitive Psychology* 49: 370-407.

Slobin, D. (1985). Crosslinguistic Evidence for the Language-Making Capacity. In D. Slobin (ed.), *The crosslinguistic study of language acquisition 2*. Hillsdale, NJ: Lawrence Erlbaum Associates: 1157-1256.

Terrell, T. (1981). Diachronic reconstruction by dialect comparison of variable constraints: S-aspiration and deletion in Spanish. In: D. Sankoff and H. Cedergren (eds.), *Variation Omnibus*. Edmonton: Linguistic Research: 115-124.

Tobler, L. (1883). Ueber den Begriff und besondere Bedeutungen des Plurals bei Substantiven, Zeitschrift fur Volkerspsychologie 14: 410–434.

Vasconcellos Lopes, R. (2006). Bare nouns and DP number agreement in the acquisition of Brazilian Portuguese. In: N. Sagarra and A. Toribio (eds.), *Selected Proceedings of the 9th Hispanic Linguistics Symposium. Somerville, MA: Cascadilla Proceedings Project*: 252-262.

Vivas, D. (1979). Order of Acquisition of Spanish Grammatical Morphemes: Comparison to English and Some Cross-linguistic Methodological Problems. *Kansas Working Papers in Linguistics* 4: 77-106.

Wackernagel, J. (1920). Vorlesungen uber Syntax, Erste Reihe [first series], Birkhauser, Basel.

Washington, J., and Craig, K. (1994). Dialectal forms during discourse of urban, African American preschoolers living in poverty. *Journal of Speech and Hearing Research* 37: 816–823.

Washington, J., Craig, H., and Kushmaul, J. (1998). Variable use of African American English across two language sampling contexts. *Journal of Speech, Language, and Hearing Research* 41: 1115–1124.

Wilson, J., and Henry, A. (1998). Parameter setting within a socially realistic setting. *Language and Society* 27, 1-21.

Wolfram, W. (1969). *A Sociolinguistic Description of Detroit Negro Speech.* Washington, D.C.: Center for Applied Linguistics.

Yang, C. (2000) *Knowledge and Learning in Natural Language.* Massachusetts Institute of Technology Doctoral Dissertation.

---- (2001). Internal and external forces in language change. *Language Variation and Change* 12: 231-250.

---- (2002). *Knowledge and Variation in Natural Language.* Oxford University Press, Oxford.