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Late bloomer or language impaired?

**Screening the speech of a Spanish-English bilingual
toddler for early signs of language impairment**

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Abstract

This case study presents corpus data gathered from a Spanish-English bilingual child with expressive language delay. Longitudinal data on the child's linguistic development was collected from the onset of productive speech at age 1;1 until age 4 over the course of 28 video-taped sessions with the child's principal caregivers.

A literature review focused on the relationship between language delay and persisting disorders—including a discussion of the frequent difficulty in distinguishing between the two at early stages of bilingual development—is followed by an analysis of the child's productive development in 2 distinct phases. An attempt is made to assess the child's speech at age 4 for preliminary signs of SLI and to consider techniques for identifying 'at risk' bilingual children (that is, those with productive language delay, poor oral fluency, and family history of language problems) based on samples of recorded and transcribed speech.

Keywords

Bilingual first language acquisition; expressive vocabulary delay; SLI

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* *Pseudonyms are used here and throughout to protect the family's privacy*

Introduction

The “ideal” child

Research in child language development has traditionally focused on the universal characteristics of language learning, and on amassing data that contribute to the image of an “ideal” or “modal” child who acquires his or her native language according to basic theoretical principles: each child employing similar cognitive and physiological mechanisms to reach milestones in phonological, lexical and grammatical acquisition according to a standard schedule (see Fenson, Dale, Reznick, Bates, Thal & Pethick, 1994 for further discussion of this “modal child”).

While theoretical linguists are largely interested in the “ideal” child learner as evidence of the existence of an innate universal grammar, applied linguists who approach child language from psychological or pedagogical perspectives are interested in this ideal for different reasons. For the latter group, establishing the “normal trajectory” of first language acquisition serves the practical purpose of helping to identify children who deviate from this norm and may have language specific disorders that impede them from correctly or efficiently processing the language(s) in their environment. As was succinctly summarized by Bates, Dale, and Thal (1995): “one cannot define ‘abnormal’ without an adequate definition of ‘normal’” (p. 1). That is, the study of the predictable patterns and timelines in child language acquisition is a necessary step on the path to diagnosing children with atypical language skills. This is problematic, however, because there is still a lack of reliable norms for many aspects of linguistic development, particularly when studying the acquisition of languages other than English.

Even more profound challenges face researchers trying to identify the “normal” trajectory of *bilingual* language acquisition (Goldstein, 2006; Bedore & Peña 2008). Not only is there a dearth of norms for the developmental patterns specific to bilingual children, there is ample evidence that the heterogeneity of this group (the variety of language

combinations and sociolinguistic circumstances) leads to a disproportionate amount of variability in comparison to monolinguals (Goldstein 2006; Thordardottir, Rothenberg, Rivard & Naves, 2006).

Although bilingual children—who have always been a substantial, yet underserved, portion of the population—are finally receiving their fair share of academic and clinical attention, the challenges inherent in identifying generalizable characteristics of bilingual development are significant (both for the group as a whole and for the smaller sub-groups of children acquiring specific language combinations). The ensuing lack of normative data greatly complicates the process of reliably identifying bilingual children who are atypically developing and at risk for language disorders (Junker & Stockman, 2002; Paradis, Crago, Genesee & Rice, 2003; Goldstein, 2006; Thordardottir et al., 2006; Ramos 2007; Simon-Cerejido & Gutiérrez-Clellen, 2007; Bedore & Peña, 2008).

Indeed, as has been pointed out in a handful of studies, bilingual children are (somewhat ironically) at risk for both over- *and* under-diagnosis of language disorders, in part because of the lack of standardized assessment tools, clinical markers, or bilingual speech pathologists in many parts of the world (Restrepo, 1998; Goldstein, 2006; Thordardottir et al., 2006; Bedore & Peña, 2008). In their study of bilingual vocabulary assessment Junker & Stockman (2002) give the alarming statistic that in the United States, for example, the majority of speech-language professionals (83% of the 713 respondents in the cited survey) perceive themselves as either “incompetent or only partly competent to deliver speech and language services to bilingual speakers” (p. 381) and feel unqualified to adequately evaluate a bilingual’s abilities. Until there is better normative data available for bilingual children in a variety of languages and reliable clinical markers are extracted from this data, bilingual children must essentially be analyzed on a case-by-case basis, and are more likely than their monolingual peers to undergo an extended period without clinical intervention.

Because bilingual children are neither more nor less likely to suffer from language disorders than monolingual children (Paradis et al., 2003; Goldstein, 2006), it is crucial

that linguists and speech-pathologists work on identifying patterns and milestones in typical bilingual development and variables that can be used to assess children who deviate from expectations and those who have language specific disorders. This process may include: (1) identifying the norms available for monolingual children and establishing the extent to which these may be expected to apply to bilingual children; (2) compiling databases on age and language-matched bilingual children; and (3) devising controlled studies to test clinical discriminators and isolate sociolinguistic variables that might effect the (mis)diagnosis of a language disorder for a specific individual or community.

The study

The present study seeks to determine whether a bilingual subject—a 4-year old child who has been exposed to Spanish and English from birth—shows signs of specific language impairment in one or both of his languages¹. A look at early data establishes the child as a “late talker”, in that he had considerably fewer than 50 words in his productive vocabulary at age 2 (see Rescorla, 1989), which is viewed as a first sign of language impairment (Rescorla, Roberts, & Dahlsgaard, 1997; Patterson, 1998). A closer examination of the child’s development over the 2.5 years documented in our corpus attempts to assess: (1) whether delays in his expressive language are the result of language impairment or simply of the normal variability that characterizes bilingual development; (2) the relevance of multilingual input patterns, sociolinguistic circumstances, and disfluency, and how they might affect an evaluation of his abilities; and finally (3) the presence or absence of clinical markers of SLI for Spanish and English-speaking children in the most recent speech samples. The research and data informing this case study are presented in 10 chapters (outlined below) and divided into 2 sections—the first largely theoretical and the second largely empirical—followed by conclusions that summarize findings and lay out future research goals.

¹ After the age of 3 the child also received some input in Catalan and German at his preschool; the extent to which he may have acquired some passive knowledge of these languages is unclear, however, and the present study treats his case as one of *bilingualism* as opposed to *tri-* or *multilingualism*. This will be discussed in more detail in Chapter 5.

The first part of the study provides a theoretical background on relevant issues regarding bilingual first language acquisition and SLI and focuses on the many variables that make it challenging to assess bilingual children for language disorders. Chapter 1 describes the great variability that characterizes both monolingual and bilingual language acquisition and addresses the extent to which an awareness of variability must inform our assessment of a child's linguistic abilities over time. Chapter 2 identifies the major issues currently at stake in the field of bilingual first language acquisition (BFLA), and the variables that differentiate bilingual development from monolingual development. Chapter 3 hones in on the difficulty of identifying developmental norms for bilingual children. It first analyzes the extent to which monolingual norms can be applied to bilinguals and then presents findings from studies that have established reliable norms for bilingual children, specifically focusing on studies of early expressive vocabulary (the area of acquisition that is among the most advanced with respect to normative data). Finally, Chapter 4 discusses specific language impairment (SLI) giving an overview of the characteristics of SLI in monolingual children across languages and the characteristics of SLI in bilingual children to the extent that they are known.

The second part of this study deals with a corpus of spontaneous language data—gathered in 28 video-recorded sessions spanning 2.5 years—that documents the linguistic development of our bilingual subject from the onset of productive speech. Chapter 5 addresses the methodology and design of the empirical study. A brief defense of the case study method is followed by a detailed description of the subject and his environment including the overall patterns of linguistic exposure during two distinct phases of development: from birth to age 3; from 3 to 4. A description of the data collection process (and of two previous studies of this same child's acquisition process) is then given before outlining the study's design, including the procedures used in the transcription and analysis of the data.

Finally, Chapter 6 looks at data from the earliest stage of our subject's productive linguistic development, assessing the acquisition of expressive vocabulary from 21 to

27.5 months. The isolation of this phase, before the onset of morphosyntax, allows us to compare our subject's development to the largest available database on age- and language-matched bilinguals. Comparison with bilingual peers allows us to reliably establish him as a late talker and identify him as being at risk for persisting disorders later in development. Because the purpose of this case study is both to evaluate specific language phenomena in one subject, and also to contribute to the body of research on bilingual SLI, it was deemed worthwhile to identify any irregularities in this earliest phase of development that might be linked to language impairment. Chapter 7 then briefly returns to theoretical issues, reviewing findings that link expressive language delay to SLI. These inform the initial assessment of our subject's speech and help us formulate hypotheses as to whether he is simply a "late bloomer" or is truly language impaired, and what might be expected in later data samples.

Chapter 8 provides an overview of the child's language abilities at age 4, looking at data from the final phase of data collection (the two months leading up to the child's 4th birthday) to identify language dominance and assess morphosyntactic and pragmatic abilities with dominance in mind. Chapter 9 analyzes data from the same phase looking for evidence of SLI. Measures of assessment that have been found to distinguish Spanish and English-speaking SLI children from their normally developing peers are applied to the data samples. Finally, Chapter 10 addresses disfluency in the child's speech and how this might affect the perception and assessment of language difficulties in general, and SLI in particular. The conclusions summarize current findings, discuss their implications, and suggest possibilities for future study as the subject's morphosyntactic repertoire increases.

Part I. Theoretical background

1. Variability in first language acquisition

1.1 Monolingual variability

Although research has largely focused on the universal features of early language development, and certain normative metrics of linguistic development (e.g. Brown's stages, MLU counts) are largely accepted for assessing monolingual children, in recent years academic attention has turned to what speech-pathologists and health practitioners have long been aware of: that early language development is characterized by considerable variability (Bates et al., 1995). For example, the developmental psychologists and speech pathologists who investigate "late" or "early" talking toddlers (e.g. Paul, 2001; Rescorla et al., 1997), routinely report large variability in the onset of productive speech, even among children with shared biological variables (e.g. sex, birth order), in similar environments, and with similar socio-economic backgrounds (Thal, Bates, Goodman and Jahn-Samilo (1997) give a review of early studies). It is worth noting that in this sense (among others) the language faculty is characterized by much greater variability than other maturational milestones like walking or crawling (Bates et al., 1995).

Large-scale studies documenting variation in the rate of early vocabulary growth (e.g. Fenson et al., 1994), as well as the "style" of language development, (Bates, Bretherton, & Snyder, 1988; Bates et al., 1995), have led to the largely accepted hypothesis that there may be "qualitative differences among normal children in the mechanisms used to acquire language" (Thal et al., 1997, p. 240). It is critical, however, that even as the range of "typical" developmental rates expands, its boundaries are defined, so that pathologists and practitioners are armed with an awareness of when extreme variation in individual children can truly be considered atypical.

One particularly noteworthy study that documents the range of variation in a large number of subjects is that by Bates, Dale, and Thal (1995), who tested the receptive and productive vocabularies of 1,800 babies English-speaking babies from 8-30 months of age. They found substantial variability in word comprehension, production, word

combinations and sentence complexity at all ages studied, although most profoundly after the age of 16 months. For example, the majority of children first show robust evidence of word comprehension between 8 and 10 months of age (p. 4). Their data showed a mean of 36 words at the 8-month point, and 67 words at the 10-month point, however the respective medians for these ages were 17 and 41 words; this distance reflected the fact that children had the bottom of the range had zero reported words until the 12-month point, whereas children had the top of the range came into the study with upwards of 90 words. Similarly, with regards to production: they found that, while there was very little variation up to the 12-month point (most children were still producing 0-10 words at this stage, and the high end of the range extended to only 24 words), this increased dramatically after 13 months, when children at the high end of the range began acquiring words at a increased rate. By 16 months, children in the top tenth percentile had reported vocabularies of at least 154 words, whereas children in the lowest tenth percentile were not yet producing any words; this heavily skewed distribution in productive vocabulary was observed throughout the 16-30 month age range (p. 5), and similarly wide ranges (represented by the large standard deviations and distances between mean and median values) were reported for word combination, and syntactic complexity. The study's extensive discussion ends with words of warning to all those aiming to make universal or unilateral generalizations about child development: "One conclusion seems uncontroversial: The Average Child is a fiction, a descriptive convenience" (Bates et al., 1995, p. 26).

Somewhat ironically, the data from Bates et al.'s (1995) study (although exposing the extreme variability inherent in first language acquisition) serves as one of the more valuable normative databases for vocabulary acquisition, reporting median values for their 1,800 subjects that serve as adequate approximations of what might be expected in typically developing English-speaking children, and ranges with useful clinical applications: they chose to identify "late talkers", for example, as those falling in the lowest ten percent for vocabulary production, and "early talkers" as those in the top ten percent.

For researchers studying children who speak languages other than English, the acknowledgement that “variability is the norm” is further complicated by the significantly smaller amount of published research. The search for greater access to normative data has led many researchers to probe the extent to which non-English speaking children can be compared to their English-speaking peers in different areas of development.

Cross-linguistic studies comparing the linguistic milestones achieved across languages have logically found certain differences, but they’ve also identified an encouraging number of similarities. For example, although minor differences have been reported in the rate of lexical acquisition across languages such as French and English (Thordardottir et al., 2006) Italian and English (Caselli, Bates, Casadio, Fenson, Fenson, Sander, & Weir, 1995; Caselli, Casadio, & Bates, 1999), and even between American and British English-speaking toddlers (Hick, Conti-Ramsden, Serratrice, & Faragher, 2002), it has been noted overall that there are close “similarities in the number of words learned at milestone stages across languages” (Bedore & Peña 2008: p 3).

Bedore & Peña (2008) give an overview of the cross-linguistic research that has reported common developmental sequences. They report that for lexical acquisition there are similarities across languages as diverse as English, Spanish, Hebrew, and Italian with regards to the number of words acquired at specific ages, although there have been differences reported with regards to the *types* of words acquired at the earliest stages: for example they report that English-speaking toddlers use proportionally more nouns than Hebrew-speaking toddlers up to the 300 word point, and proportionally more nouns and predicates than Italian-speaking children up to the 100 word point (Italian-speaking children, in contrast, acquire proportionally more social and closed-class words) (p. 4). In lexical acquisition across languages children have been found to make remarkably few naming errors, and the errors they do make tend to be logical. Thordardottir et al. (2006), for example, studied French and English-speaking children aged 21-27 months and found that, while the English-speaking children made slightly more lexical errors than their French-speaking peers, they made errors, on average, only 3% of the time. It has also been suggested that children’s errors tend to stem from a simple lack of experience, (for

example, overextending the name for the most similar concept available when encountering a new referent for the first time), and often reflect an effort to hypothesize about the world around them (Crystal, 1998).

With regards to morphosyntactic acquisition, it has been shown that the well-documented progression made by English-speaking children from single words to word combinations to complex forms such as questions and negatives (i.e. Brown's stages: see Brown (1973)) hold true for a number of other languages such as Spanish, Italian, and Japanese (see Bedore & Peña 2008, again, for a review of this research). Of course, due to cross-linguistic differences at the syntactic, semantic, and discourse levels, certain dissimilarities in the rate of word combinations have been noted (Thordardottir, 2005). For example, it has been reported that although English-speaking children first acquire 2-word utterances at around 2 years of age, their Spanish-speaking peers at this age already have an average MLU-w count of 2.5 (Echeverría, 1979). The cross-linguistic differences observed in the onset of word combinations and morphosyntactic acquisition may be due to phonetic salience, frequency in the input or structural complexity. For example, whereas the past tense in English is low in salience because it is generally realized with an unstressed final consonant (e.g. "walked" is pronounced "walkt"), the past tense in Spanish is generally marked with a stressed vowel (e.g. "caminó") and thus is more salient. In English, the simple past doesn't emerge until children are around 4 years old whereas children learning Spanish produce past tense verbs a full year earlier, at age 3 (Bedore & Peña, 2008). Cross-linguistic differences of this nature indicate that a child's morphosyntactic development should, whenever possible, be assessed in comparison to age- and language-matched peers, particularly when the stakes are high, as is the case for children at risk for language impairment.

Notwithstanding all of the above-mentioned variability, when one considers the highly complex process of acquiring a first language and the number of child-specific circumstances at play (many of which have yet to be formally scrutinized), it remains astonishing that there are as many similarities as there are in terms of rate and sequence of linguistic development both within and across languages, and indicative of underlying

universals in the language faculty. At least for English, and several other widely spoken world languages (including Spanish), there is enough data so that, even after accounting for variability, we may still speak confidently of certain typical linguistic milestones. While it will always be preferable to compare a child to a normative database specific to the language (or languages) he or she is acquiring, the generalizable data on the “normal development” across languages may still be viewed as a valuable resource, and one that can provide guidance in identifying atypical delay.

1.2 Bilingual variability

Despite an increased awareness in recent years of the normalcy of “bilingualism as a first language” (Swain, 1972), most researchers in the field choose to call attention to the fledgling nature of BFLA as an academic discipline, and even the most prominent large-scale studies tend to hedge their findings with calls for further research on different language pairs or with greater attention to sociolinguistic factors (e.g. Pearson et al., 1993, 1995; Genesee, Nicoladis, & Paradis, 1995; Patterson, 1998).

As aptly summarized by Grosjean (1998) “working with bilinguals is a more difficult and challenging enterprise” (p. 131) than working with monolinguals; the variability inherent in the heterogeneous bilingual community is even more striking than that observed among their monolingual peers. To help inform our analysis of bilingual variability, chapter 2 will first orient us within the framework of BFLA theory: discussion will first be made of the various debates concerning the bilingual acquisition process, and the plethora of linguistic areas that have attracted research attention. Chapter 3 will then bring our focus back to variability and the search for norms in the study of bilingual children.

2. Topics in Bilingual First Language Acquisition (BFLA)

2.1 The case study tradition

Due to the heterogeneity of bilingual children as a group and the difficulty (in many cases) of amassing a large group of children who share enough common characteristics to warrant comparison, much of the currently available information about bilingual development continues to come from published case studies (often carried out by linguists studying their own offspring). Case studies of bilingual children have a considerably longer tradition than other field methods in BFLA, including still-cited classics by Ronjat in 1913, and Leopold in 1949, in which these linguists chronicle their children's acquisition of French-German, and German-English respectively.

The notion that general information can be extracted from the study of individual children may appear specious, however when these case studies are taken as a collective, we can indeed identify patterns that invite generalizations about the processes and pitfalls of learning several languages at once; furthermore, many of the larger-scale studies of recent history have identified their research goals and hypotheses on the bases of observations made about individual bilingual children.

Overall, through the efforts of a handful of groundbreaking case study authors (and their critics) such as Volterra & Taeschner (1978), Vihman (1985), Genesee (1989), De Houwer (1990), Meisel (1990) Quay (1994), Nicoladis & Genesee (1996); Deuchar & Quay (1999), Lanvers (1999), and Juan-Garau & Perez-Vidal (2001), the field of BFLA has amassed a considerable amount of information about what bilingual development *can* look like in a variety of different contexts and for a variety of language pairs. Below some of the findings of these case studies will be presented, along with follow-up data from larger studies (when available), to give an overall picture of the trajectory of BFLA thus far.

2.2 What does it mean to be bilingual?

Although the term “bilingual” is used loosely in much of the popular literature on acquisition, there are conflicting opinions in the scientific community as to what exactly it means to be bilingual, and the ways in which this label can be refined or qualified. For those studying BFLA (bilingual *first* language acquisition) perhaps the most fundamental dichotomy is the one that separates *simultaneous* bilinguals from *sequential* bilinguals, although there is disagreement over the age by which a child must be exposed to two languages to warrant the label of a simultaneous bilingual. For the strictest interpreters, and most of the case studies cited above (e.g. Quay, 1999) simultaneous bilingual subjects are those that have been exposed to two languages from the very beginning of development, or within days after birth. For others, however, the term simultaneous bilingualism applies to cases of exposure within the first few years of life, often specifically before the age of 2. De Houwer (1995), in an influential review of BFLA topics and influences, leaves the exact age of exposure unspecified, stating simply that BFLA refers to “the result of the very early, simultaneous, regular, and continued exposure to more than one language” (pp 223). In general, if the child is exposed to only one language until after age 2 or 3, it is thought of as a case of sequential bilingualism, and more aptly described as the early acquisition of a second language.

Even once we have agreed on an acceptable, if flexible, definition of bilingual first language acquisition, we are still confronted with a number of qualifying terms in the literature, such as “productive bilingual”, “passive bilingual”, “incipient bilingual”, or “balanced bilingual”, reflecting the plethora of variables at play in BFLA, and attesting to the difficulty of making broad generalizations about the bilingual experience. As was aptly summarized in a review by Goldstein (2006): “bilingualism might best be viewed as a complex phenomenon, and measured on a continuum” (p. 312). At one of the continuum we might find “balanced bilinguals” who have relatively equal abilities in both languages and switch comfortably between them, whereas at the other end we have “passive bilinguals” with the ability to comprehend, but not produce, one of their two languages; in the middle we encounter various degrees of “*x*-dominant bilinguals” who have greater facility in one of their two languages (either across the board, or with

regards to certain specific skills) and often show a reluctance to use the weaker language unless under direct communicative pressure to do so. In many cases it is easiest to describe one's bilingual subjects with a number of qualifying tags, such as a "simultaneous, Spanish-dominant bilingual" or "predominantly English-speaking bilingual"; these definitions, although cumbersome, can give a more complete picture of the child's language profile.

An awareness of the child's age of exposure to each language, the amount and type of input received, and the distribution of abilities between them, will help to inform the selection of qualifiers, and becomes particularly important when attempting to draw comparisons across studies and address the theoretical issues discussed in the following sections.

2.3 Language Differentiation and Translation Equivalents

One question that has received considerable attention in the field of BFLA research is whether or not bilingual infants are aware that they are acquiring two different languages, and, if so, when and how this awareness evolves. Although this question has been resolved for certain subgroups of the bilingual population, researchers continue to investigate ways to reliably generalize with regards to language differentiation, with good reason: if early language differentiation could be established as a characteristic of typical language development, it would be highly useful for researchers that investigate deviance from an expected trajectory, as the phenomena is testable from the very onset of productive speech. The debate regarding language differentiation is summarized below, however a considerably more detailed review of the debate can be found in Barquin (2006).

Some of the earliest, and most influential, case studies in BFLA argued that bilingual babies go through a period in which they treat their two languages as a single fused system (e.g. Volterra & Taeschner, 1978; Redlinger & Park, 1980; Vihman, 1985). Critics, however, have since shed doubt on this theory by showing that bilingual babies may be able to differentiate between their two languages from the earliest stages of

productive speech (e.g. Genesee, 1989; Quay, 1995; Pearson, Fernandez & Oller, 1995; Genesee, Nicoladis & Paradis, 1995; Deuchar & Quay 1999, 2000). Because it is difficult to prove that bilingual infants can separate their languages prior to productive language, proponents of the dual-system theory have focused on demonstrating that bilingual toddlers do not use their languages in the indiscriminate fashion that would be predicted if they treated both as belonging to a single system.

The “unitary language system hypothesis” (as dubbed by Genesee, 1989) argues that bilingual babies go through an initial period in which they are unable to differentiate between their two languages; the process of differentiation is described by Volterra and Taeschner (1978) as spanning three concrete stages: the first stage of development is marked by an initial lack of language separation in which “a word in one language almost always does not have a corresponding word with the same meaning in the other language” (p. 312), and there is a preponderance of mixed utterances; in the second stage, the level of language mixing declines, and cross-language synonyms begin to appear; and in the third stage the child is finally able to productively separate their two languages, and make pragmatically appropriate language choice depending on their interlocutors (Volterra & Taeschner 1978, p. 312).

This description of the bilingual process continues to be heavily influential in BFLA. (Volterra and Taeschner’s findings form the backbone of the entry on bilingual child acquisition in the 2005 Edition of the Cambridge Encyclopedia of Language.) In recent years, however, researchers have disputed the two main sources of evidence for an initial, pragmatically confused, stage of development: they have argued that translation equivalents are present in children’s earliest vocabularies, and that mixing may not indicate confusion, but result from lexical gaps. It has been repeatedly suggested that methodological flaws in Volterra & Taeschner (1978) led to their misinterpretation of these phenomena (Genesee 1989, 1995; Quay 1995; Pearson et al., 1995).

In one of the first studies to articulate an alternative hypothesis, Genesee (1989) disputes the notion that children’s language mixing is evidence of semantic confusion, arguing

that there are other more tenable explanations for mixed utterances, such as parental input, language dominance, or lexical gaps in early vocabulary. Genesee (1989) further claims that mixing cannot be viewed as evidence for a unitary language system without showing that children indiscriminately use items from both languages in all communicative contexts; he suggests that a reanalysis of past data might show that children tend to functionally separate their languages as much as possible given the limits of their developing vocabularies, and argues for a theory that children, even at early stages, have differentiated underlying language systems.

Follow-up studies analyzing bilingual children's language mixing provided initial support for the "differentiated systems hypothesis". Genesee et al. (1995), for example, studied 5 bilingual children between the ages of 1; 10 to 2; 2 and found that the children mixed more often when using their weaker language than when using their dominant language; they also found evidence that bilingual children between the one- and two-word stage were able to differentiate between their languages according to interlocutor, and cited concurrent results from De Houwer (1990), Meisel (1990), Lanza (1992), and Goodz (1994).

Translation equivalents (TEs)—also referred to in the literature as cross-language synonyms, equivalent pairs, or doublets—are words in two languages that have the same referential meaning (Nicoladis & Genesee 1996: 444), and their presence or absence in early bilingual acquisition has been central to the debate concerning language differentiation. Although it was initially thought that bilingual children did not acquire translation equivalents in the first stage of development (largely based on Volterra and Taeschner (1978) in their case study of two Italian-German bilingual children), a number of later studies offer convincing evidence to the contrary. For example Quay (1995) collected video footage of a Spanish-English bilingual child, Manuela, using Spanish and English labels for the very same toys in her nursery, leaving little room for doubt that the child's equivalent pairs had identical referents. The methodological rigor of Quay's study has helped resolve any residual disagreement about whether young bilinguals truly acquire translation equivalents at early ages. (A perhaps inappropriate amount of research

attention has been focused on critiquing Volterra & Taeschner for the methodological and theoretical flaws that may have led them to misinterpret their data (e.g. Pearson, et al., 1993, 1995; Quay, 1995; Deuchar & Quay, 1999). They have specifically harped on the fact that Volterra & Taeschner's records for each child did include some equivalents, and that their frequency and relevance was underestimated. Volterra and Taeschner (1978) explicitly dismissed the few translation equivalents in their data by noting that: "the children often do not appear to consider such words as exactly corresponding to each other" (1978, p. 314). Numerous studies have since documented cases of children who have systematically acquired TEs from the very beginning of their productive speech (Pearson, et al., 1993, 1995; Deuchar & Quay, 1999; Holowka, Brosseau-Lapre, & Petit, 2002). Notable among these, Pearson, et al. (1995) studied 27 developing Spanish-English bilinguals from 8 to 30 months in age, reporting that all but one of the children had TEs in their earliest vocabularies, and that TEs comprised, on average, 30% of the babies' lexicon.

Since it has been established that at least *some* children acquire TEs from the beginning of development, the question is why this phenomenon has theoretical importance. TEs have frequently been used in experiments looking for empirical evidence of language differentiation and pragmatic awareness, their role in the debate often hinging upon Eve Clark's (1988) Principle of Contrast, which predicts that monolingual children will reject synonyms in early lexical acquisition. Clark's principle extended to bilingual children predicts that they will reject translation equivalents (two forms for the same referent) until they become aware that they are dealing with two different languages. Once bilinguals become linguistically aware, however, "they need only apply contrast within each language. They should then accumulate doublets freely" (Clark 1993, p. 95). The Principle of Contrast has thus enabled both sides of the debate to use TEs as evidence that young bilinguals are "linguistically aware" (e.g. Nicoladis & Genesee, 1996).

Crucially, TEs provide a young bilingual with the opportunity to make an appropriate (or inappropriate) language choice (Quay, 1995) and thus can be used as a lens to examine the evolution of bilingual babies' pragmatic awareness. Nicoladis & Genesee (1996), for

example, analyzed the use of translation equivalents by children aged 1; 7 to 3 and found that their subjects tended to use their TEs in contextually appropriate ways, and produced mixed utterances more frequently when they lacked equivalents for the inappropriate words (these findings were confirmed by Deuchar & Quay 1999). In cross-modal study, Holowka et al., (2002), found that there were a significant number of translation equivalents in their (French-English or French-LSQ) babies' early lexicons, extrapolating that "bilingual babies *do* produce TEs and they do this because they know they are acquiring two distinct lexicons, which they know from their earliest lexical productions" (p. 245, emphasis mine).

The most recent research (notable for its methodological improvements over the earlier studies that developed the unitary system hypothesis) thus supports Genesee's (2001) claim that "current evidence indicates consistently and clearly that bilingual children can use their developing languages differentially and appropriately with different interlocutors from the earliest stages of productive use" (2001, p. 155).

2.4 The effect of input patterns and sociolinguistic variables

As confirmed by the studies cited in the above debate, it is clear that bilingual children *can* become semantically aware at a very young age, and that the acquisition of TEs early on in development can serve as evidence of this awareness. It still remains unclear, however, to what extent the acquisition of equivalents may be seen as a *general trend* in BFLA or evidence that *all* bilinguals separate their languages from the beginning of development.

Most of the studies cited in the previous section paid little attention to the sociolinguistic features of their subjects' environments that may have fostered language differentiation abilities (Lanvers, 1999), and one could argue that the majority of the above subjects acquired their languages in conditions that foster early language differentiation (that is, most had two highly educated parents who consistently and consciously used only one language with the child (e.g. De Houwer, 1999; Juan-Garau & Perez-Vidal, 2001; Holowka et al., 2002), or strictly separated a "home" language from a "community"

language in different physical spaces (e.g. Deuchar & Quay, 1999). One could also argue that these conditions are not the norm for the majority of bilingual children in the world (Döpke, 1998).

It remains possible, therefore, that *some* babies learn to differentiate between their languages early on (and acquire TEs), whereas others do not, and that this difference is due to the role of sociolinguistic factors like parental input and language context. A closer examination of results found by Pearson et al. (1995) demonstrates this possibility: in describing the subjects of their study on TE acquisition, they mention that, of the 18 children who were observed frequently: “nine...experienced a relatively consistent language environment throughout the data collection period, while nine children experienced changes in the percentage of time they were exposed to each language, including four who experienced switches in the predominant language” (p. 351). Their analysis provides a fleeting glimpse as to how this may have affected at least one of their subjects, subject 64, who “[from ages 1; 10 to 2; 0] experienced a rise in total vocabulary, English vocabulary, and doublets, while his Spanish singlets dropped; that is, he was adding almost exclusively the English equivalents for words he already knew in Spanish” (p. 359); they also mention that the child “was being prepared for a change in his language environment” and that “his mother was, in effect, teaching him to switch his vocabulary to the other language” (p. 359). Only briefly, however, do they mention that the *variation* in their subjects’ acquisition of TEs indicates that some children may have a preference for or against them, and that it remains possible that some children have one initial lexical system, whereas others have two (p. 366).

Although the data reported by Pearson et al. (1995) suggest that input may affect children’s abilities to separate their languages, they downplay this possibility; they concede in their conclusions, however, that “such possibilities suggest that future research on this topic should carefully monitor the child’s input from each language and the relationship of different patterns of language exposure to the actual translation equivalents learned” (p. 366). The data from their “subject 64” specifically suggests that two aspects of input should be attended when analyzing the acquisition of translation

equivalents: changes in language context, and parental strategies.

Lanvers (1999) responded to this call for further research, and used the case study of a developing German-English bilingual (her son Louis) to argue that changes in input over time affected the child's acquisition of translation equivalents. She complements data on lexical acquisition with information from diary entries documenting environmental changes like travel and visits from monolingual relatives, and notes that changes in the rate of equivalent acquisition were linked to changing input; specifically, she claims that (for Louis): "the months of high equivalent learning see a change of linguistic environment, providing more input in the formerly weaker language" (p. 45). She concludes that bilingual infants' ability to separate their languages (that is, their possession of one language system or two from the very beginning) is not a *general* neurolinguistic feature of bilingual acquisition, but largely dependent on environment—specifically, on types of input (Lanvers 1999, p. 48).

The events recorded by Lanvers (1999), such as travels or visits from relatives, all marked changes in the type and amount of input her subject was exposed to in each language, and ones that had an effect on his acquisition of TEs. One can build upon Lanvers' analysis by further noting that these events tended to share a common feature: they exposed the bilingual child to purely monolingual contexts for brief periods of time. It has been observed that the exposure to monolingual vs. bilingual contexts of interaction can have an important effect on young bilinguals' progress in their weaker language, as well as the amount of mixing present in their speech (Lanza, 1992; Döpke, 1998; Juan-Garau & Perez-Vidal, 2001).

In many of the case studies cited in section 2.1, almost the sole information given regarding parental input is the observation that the parents abided by the 'one person-one language' policy, in which each parent addresses the child exclusively in one language. This policy has long been viewed as the best method for establishing balanced bilingualism, however it has also come under attack for being unrealistically difficult for the majority of bilingual families (Döpke, 1998).

Furthermore, researchers have found that ‘one person-one language’ does not ensure productive use of the minority language (Döpke, 1992; Yamamoto, 1995), and that many bilinguals in the world achieve productive bilingualism through far more variable and unstructured exposure (Lyon, 1996). It is clear that the greatest challenge in raising bilingual children in a monolingual community, however, is ensuring that they become productive speakers of the minority (i.e. non-community) language, especially when their parents and regular caregivers are bilingual as well. While punctual events such as those described in Lanvers (1999) may have an important effect on development, the consistent input the child receives from his or her parents and regular caregivers is perhaps the most relevant predictor of their productive use of the minority (i.e. non-community) language, and their ability to make pragmatically appropriate language choices.

Juan-Garau & Perez-Vidal (2001) in their study of a Catalan-English bilingual child, discussed the affect of conscious parental strategies on their subject’s bilingual production, noting that: “bilingual parents can negotiate either a bilingual or monolingual context of interaction with their children” (p. 61), and finding direct links between strategies that established a monolingual context and the child’s production of English (the minority language). They specifically noted that, because the child was aware that his father was a speaker of Catalan, he frequently mixed and resorted to Catalan, his stronger language, until the father invented a third party interlocutor (an English-speaking puppet) who demanded unmixed and intelligible English conversation. After the child was introduced to this “monolingual” puppet, his production of English increased significantly.

Whether it is through resourceful solutions such as that described in Juan-Garau & Perez-Vidal (2001), or the more routine solution of looking for a caregiver or external setting in which the child encounters monolingual speakers of the minority language, it is clear that some contact with monolinguals is highly useful (perhaps necessary) in encouraging the child to resort to their weaker language. While the best motivator will always be interaction with monolinguals (there is no substitute for necessity in either BFLA or adult

second language acquisition), both Lanza (1997) and Juan-Garau & Perez-Vidal (2001) have shown that a conscious effort made by parents (beyond ‘one person-one language’) to put communicative pressure on the child to use the minority language can have a marked effect on the child’s development in that language.

In summary, parents who negotiate a mostly monolingual context with their children (who make use of strategies to discourage their children’s mixing, and who avoid mixing themselves) tend to have the most success in encouraging productive bilingualism (Döpke 1998 provides a review of other studies that demonstrate this link); if, on the other hand, the child’s regular caregivers are overtly bilingual but the community at large is monolingual, a clear preference will tend to develop for the community language, and, without active adult intervention, the child will likely develop only passive understanding of the minority language, or, eventually, even lose it completely as their experience with the outside community expands.

Other sociolinguistic variables that may have an affect on progress in BFLA include input *quality*, the attitudes towards bilingualism in the family and the community, socio-economic and educational factors, as well as psychological features such as personality and the child’s relationships with his or her adult interlocutors.

Juan-Garau & Perez-Vidal (2001) address the first of these variables, noting that “limited exposure to the minority language may somehow be compensated by quality of interaction” (p. 62); that is, the *quality* of input may be just as important as the *quantity* of the input (provided this input is monolingual in nature) so that a child who receives only limited weekly exposure to a minority language—for example from a grandparent or caregiver—may still acquire productive competence in this language, provided the exposure is sufficiently stimulating and places communicative demands on the child. This hypothesis is supported by evidence from Patterson (2002), who showed that the frequency of reading to bilingual children (high quality, child directed input involving direct adult attention and modeling) was correlated with the size of their expressive vocabularies.

It has also been suggested by Fantini (1985) and others that the attitudes towards bilingualism in the family and the community at large are important factors in a child's active bilingualism (and Juan-Garau & Perez-Vidal (2001) add that the prestige of the minority language in the community can have a further effect). Essentially, if a child is raised in a bilingual community, or if the outside community respects the minority language as a useful skill or sign of culture (as is the case with English-speaking bilinguals in many parts of Europe), it is more likely that the child will develop a feeling of pride in their bilingualism and seek out opportunities to demonstrate their knowledge of the minority language. If, on the other hand, the parents feel stigmatized as speakers of a minority language and the community at large is dismissive of the advantages of bilingualism (as is the case, for example, with many pockets of Spanish-speaking bilinguals in the United States) it is far more likely that the child will develop a preference for the community language and lose productive abilities in the home language.

Finally, the individual personality of the child and his or her relationships with the adults who provide input in each language may affect the progress of BFLA; a negative relationship with a parent or caregiver who provides exposure to a minority language may, logically, lead to a distaste for that language and a desire to avoid it whenever possible (see Juan-Garau & Perez-Vidal, 2001, for an inverted perspective on this same argument). Additionally—particularly in cases of children with fluency problems or other impaired skills—some children have negative attitudes towards their language abilities (Bernstein Ratner, 2004), which may affect one language more than the other and lead the bilingual to avoid that language.

2.5 Language Dominance

Bilingual children, even those with simultaneous exposure from birth, frequently have unbalanced abilities in their two languages (Paradis et al., 2003; Thordardottir et al., 2006), often based on the input they receive from adults and their access to monolingual speakers of each language. Language dominance can change over time as bilinguals have

new experiences with each of their languages, because of the environmental changes (e.g. Lanvers, 1999) parental strategies (e.g. Juan-Garau & Perez-Vidal, 2001), or sociolinguistic variables discussed above. In general, as observed by Paradis et al. (2003): dominance “is typically closely linked to the amount of input the bilingual child receives in each language, which is seldom equal” (p. 115; see also, Genesee et al., 1995).

Indeed, it is worth noting here that the completely “balanced bilingual” may be as much a myth as that of the “average child” in monolingual acquisition, and the vast majority of bilinguals have an unequal distribution of skills across their two languages (Goldstein, 2006); this is especially true when taking into consideration that the skills of individuals in each of their languages may shift and change over time, so that even a bilingual who is initially “balanced” may develop an “imbalance” as schooling, environmental changes, or new interlocutors give them greater exposure to one of the two languages.

For some bilingual children language dominance is extreme and may mean that they have only a passive knowledge of one of their two languages (for a brief period, or for an extended period, even, in some cases, leading to language loss and eventual monolingualism). For other children language dominance may be less pronounced, but have psychological repercussions, such as a lack of confidence in the weaker language that leads them to underrate their abilities and avoid opportunities to practice.

Early language dominance can be seen in the disproportionate acquisition of new vocabulary in the stronger language (e.g. Goldstein, 2006) and the greater proportion of mixed utterances in the weaker language (e.g. Genesee et al., 1995). While it is still unknown whether bilingual children are likely to acquire grammatical morphology more slowly in their weaker language, they have been shown to demonstrate more errors in their dominant language (Paradis et al., 2003) due the greater amount of output, a phenomenon that raises red flags about the importance of accounting for language dominance when assessing a child for language impairment; that is, a child may appear more delayed, but on-par with MLU matched peers in terms of the percent of errors in

speech in his or her weaker language, whereas the reverse pattern may be seen in his or her dominant language.

In general, when analyzing bilinguals' language skills, either for evidence of language differentiation (as has so often been the case), or potential language disorders (the premise of the present study), it is generally recognized that children should be assessed in each of their two languages, that language dominance be identified, and that the skills in each language be analyzed both separately and compositely (Thordardottir et al., 2006; Goldstein, 2006; Bedore & Peña 2008). When comparing a bilingual to monolingual peers, for example, it is likely that they will appear significantly below the normal range in their weaker language (Thordardottir et al., 2006), which may lead to an inappropriate concern about their overall development. In general, scholars interested in assessing bilinguals for possible language impairment recommend that the child be thoroughly assessed in their dominant language, as age-appropriate skills in either one of their two languages would rule out the presence of disorder (Ramos, 2007).

2.6 Summary

In summary, we have seen that bilingual children are a heterogeneous group and there are many variables that may affect their linguistic progress; not only are there literally thousands of possible language pairs being simultaneously acquired that may lead to cross-linguistic differences in the development of morphosyntax, even two bilinguals acquiring the same language pairs may differ from one another in terms of their mental representations of their languages (one or two systems), the amount and context of exposure to each (monolingual and bilingual contexts; presence of the language in the home and community), and the myriad sociolinguistic variables that factor in to their acquisition of two languages simultaneously.

That said, for the many reasons laid out in the introduction to this study, it is essential to be able to draw comparisons between bilingual children and their bi- and monolingual peers, and attempt to establish certain norms for bilingual children so that irregular

development may be noticed and treated. The following chapter will discuss recent studies that have attempted to responsibly compare data from bilingual and monolingual children and collect data from large groups of bilingual children on different linguistic phenomena.

3. In search of bilingual norms

When bilinguals are compared to monolinguals with regards to the rate and sequence of acquisition across linguistic domains, it has generally been found that: the phonological acquisition of bilingual children is similar to that of their monolingual counterparts; they tend to learn the grammatical forms of each of their languages in similar orders as those followed by monolinguals; and their rate of morphological development is similar as well (Goldstein 2006). These findings have held true for a variety of language pairs including Spanish-English (Fantini, 1985), German-French (Meisel, 1994), and French-English (Paradis & Genesee, 1997). Finally, and perhaps most importantly for this study, it has been observed that bilingual children are similar to monolingual children with respect to language errors, in that they make relatively few, and that “the errors they do make tend to be productive (reflecting knowledge of the rules of the language) and logical” (Bedore & Peña, 2008, p. 20).

In short, many researchers have found that the overall patterns in bilingual acquisition parallel those of monolinguals (De Houwer, 1990; Genesee et al, 1995; Paradis & Genesee 1996; Quay 1995; Paradis et al., 2003), thus inviting a certain amount of comparison. These same researchers, however, routinely urge that their results be interpreted with caution, and that special attention be paid to the unique nature of the bilingual experience and the potential effect of language contact. Paradis et al. (2003) in particular outline three possible influences that language contact might exert on the acquisition process that would lead to quantitative and qualitative differences between bilinguals and their monolingual peers: (1) *acceleration*—in which a grammatical property might emerge earlier in one language than is typical in the monolingual context, perhaps because a similar structure is available in the other language and a type of

bootstrapping occurs; (2) *deceleration*—in which progress in both languages, either in general or with regards to specific structures, proceeds at a slower rate due to the greater burden on the child’s cognitive/processing resources; and finally, (3) *transfer*—in which linguistic structures from one language are borrowed into the other for a temporary phase in development and thus cause the appearance of unique structural patterns in the bilingual system (see Paradis et al., 2003, p. 115). When observing patterns or rates in bilingual development that differ from monolingual expectations, each of these three hypothetical causes must be considered before drawing any conclusions about a language delay or disorder.

Whether or not bilinguals are being compared to monolinguals or other bilinguals, the vast amount of variability makes it even more difficult to speak of “norms” in bilingual acquisition than in monolingual acquisition. Due to the many variables and heterogeneous circumstances potentially effecting a bilingual’s development—and the difficulty of controlling for all of these at once when undertaking a large-scale experiment—many studies of similar phenomena have obtained conflicting results, thus further complicating the process of acquiring normative data.

The search for bilingual norms, with its successes and pitfalls, will be illustrated below by presenting findings from several studies that have addressed a single phenomenon: the acquisition of expressive vocabulary from the onset of production, one of the most widely studied phenomena in BFLA, and therefore one of the few areas about which we can identify concrete milestones with reasonable confidence.

3.1 Early Expressive Vocabulary

One of the most frequently studied aspects of bilinguals’ linguistic development is the acquisition of early productive and receptive vocabulary. This is true for a variety of reasons, the most practical of which being that “vocabulary is available for study from the earliest stages of language acquisition” (Junker & Stockman, 2002, p. 382), unlike syntax and other more complex measures of language development.

As a whole, lexical acquisition, and especially the acquisition of productive vocabulary, is the area in which the most progress has been made with regard to establishing quantitative norms, and thanks to the large-scale studies described below, we finally have access to a substantial normative database with regards to early vocabulary growth. The most common method of study has been to calculate the size of bilingual's productive vocabularies (both within and across their languages) from the beginning of acquisition and track the rate of growth, comparing these to the available lexical acquisition data for monolinguals in each of the two languages; later studies, however, have been able to jump straight to homogeneous bilingual groups and make within-group comparisons, giving a better feeling of the range of variability in bilingual acquisition. Following the scheme laid out in the introduction to this paper, a general presentation of the research on bilingual expressive vocabulary will be described below, but the relevant quantitative data will be extracted and presented in more detail in chapter 6, to facilitate direct comparison with the data available for our own subject.

3.1.1 Early vocabulary size and composition

One of the first large-scale studies of early bilingual vocabulary was conducted by Pearson, Fernandez and Oller (1993), in which 25 simultaneous Spanish-English bilinguals were compared to 35 monolingual Spanish or English-speakers, with regards to the size of their productive and receptive lexicons. The subjects ranged from 8 to 30 months in age, and the primary motive was to establish guidelines for identifying lexical delay in bilingual babies and toddlers (Pearson et al., 1993, p. 94). Knowledge about the children's productive and receptive vocabularies was obtained using the MacArthur Communicative Development Inventory (Fenson et al., 1993), a parental report form that requires parents to check items on an extensive list of possible words in their child's repertoire.

Due to the groundbreaking nature of this study, the first issue tackled was how exactly to measure a bilingual child's vocabulary in order to compare it to monolingual standards. They established two possible metrics: Total Vocabulary, which counts all unique lexical items, including translation equivalents, though giving only one count to words that are

phonetically similar across languages, or non-language specific; and Total Conceptual Vocabulary, which subtracts translation equivalents and counts only those items which represent unique concepts, thus calculating how many *concepts* a bilingual child possesses in comparison to a monolingual child. (Many studies have since copied this methodology of dual-vocabulary assessment, such as those by Junker and Stockman (2002) and Holowka et al., (2002) discussed in detail below).

Their data showed that, although the bilinguals' knowledge was logically distributed between their languages, bilinguals' Total Vocabularies (and even their more conservatively calculated Total Conceptual Vocabularies) were *comparable in mean and range* to those of their monolingual peers. Their data further indicated that, with regards to comprehension, the bilinguals' abilities in each language fell within the range of monolingual norms *even when viewed separately*.

The results from this study were corroborated cross-linguistically by Junker and Stockman in 2002. Junker and Stockman studied 10 German-English bilinguals from 24 to 27 months of age, analyzing expressive vocabulary size and vocabulary "richness" (as measured by the presence of verbs, discussed in the following section). In this study, they used the Language Development Survey (LDS) developed by Rescorla (1989) to obtain their vocabulary data—a different, but comparable, parental report form to the MacArthur CDI—citing the CDI's lack of blank slots for parents to write in any missing forms as their reasoning for choosing the LDS (p. 386).

Notwithstanding any differences that might have arisen due to slightly the different data collection materials, Junker and Stockman's results confirmed those of Pearson et al. (1993). They found that their bilingual subjects had expressive vocabularies comparable in size to those of the monolinguals, even observing that the mean Total Vocabulary of the bilingual group *surpassed* the means of the monolingual groups, although falling short of significance and likely due to the small number of subjects (Junker & Stockman, 2002, p. 389).

Further cross-linguistic and cross-modal evidence confirming bilinguals' potential to meet monolingual milestones, was found by Holowka et al (2002), studying 6 bilingual/bimodal babies (3 were acquiring French and English, while 3 were acquiring French and Quebecoise Sign Language) ranging from 7 to 26 months of age. Though the main focus of this study was to address the semantic knowledge behind the first signs and words in bilinguals' repertoires, their total and conceptual vocabularies were calculated using the CDI—adapted for French and LSQ—and compared to monolingual norms. It was found that the bilingual babies achieved the important milestones of producing their first word and acquiring their 50 words within the same age range observed in monolinguals; the first word milestone was reached in *each* of their languages within this range, and the 50-word milestone was reached at similar ages to typical monolinguals when one considered the *total vocabulary* of the two languages combined, thus confirming conclusions by Pearson et al. (1993) that bilinguals' productive vocabularies are on par with those of monolinguals.

Finally, a study by Patterson (1998) measured the productive vocabulary of 102 Spanish-English bilingual children from 21 to 27 months in age. Breaking with the pattern observed thus far of comparing bilinguals to monolingual norms, this study sought instead to amass a substantial number of bilingual subjects and use the data to contribute to a normative database that would help identify bilingual toddlers with expressive language delay.

Data was collected using the LDS (Rescorla, 1989). Patterson's data will be presented in detail below, but the results generally indicate that the majority of bilingual 2-year olds, like their monolingual Spanish and English-speaking peers, possessed expressive vocabularies of more than 50 words, and were beginning to combine words by this age as well. While the goal of the study itself was not to compare bilinguals to monolinguals in terms of vocabulary size, a retrospective comparison of Patterson's results with those of Pearson et al. (1993) indicate that, although the mean vocabulary size of her 102 bilingual subjects fell within the range of the mean *bilingual* vocabulary size reported by Pearson et al. (1993), it did not arrive within the range reported for the monolinguals of that study.

Thus, for this study at least, it seems that the bilinguals indeed “fell short” in comparison to the monolingual norms available for Spanish and English vocabulary acquisition.

The differences in mean vocabulary size seen across the above studies—and particularly in Pearson et al. (1993) and Patterson (1998), which report on the same language pair—serves to draw our attention back to the importance of sociolinguistic variables and linguistic environment when attempting to compare bilinguals. Patterson (1998) reports the most markedly different results, but her methodology indicates that the sociolinguistic profiles of her 102 subjects may have been markedly different from the subjects of the other studies in important ways. In Pearson et al. (1993), for example, subjects were recruited from a previous study (repeat participation indicating a certain amount of interest in language development by the parents) and it was reported that “all parents of bilinguals expressed a desire to provide an environment equally between the languages” (p. 98), which further indicates an active interest in the child’s bilingual development. The babies studied in Holowka et al. (2002) and Junker & Stockman (2002) seem to have shared similar advantages with regards to parental investment and effort to provide balanced exposure. In Holowka et al. (2002) the six longitudinal subjects were extracted, by parental self-selection, from a larger initial number: they were left with families who were willing to participate in a year-long longitudinal study involving monthly recording sessions outside of the home (requiring a considerable investment of time, thereby indicating a considerable amount of parental interest in the results); the researchers expressly note that “each parent of each child identified himself or herself as using primarily one language with his or her child” (p. 222).

In contrast to the methods of the above three studies, Patterson (1998) recruited subjects from the community in “public health clinic waiting rooms, stores, and cultural events” (Patterson, 1998, p. 48); only one parental interview was completed, and this took place at the parent’s home or workplace according to their preference. These factors may have led to a more representative, and less self-selecting, group of families, including parents with lower levels of education and those less likely to be actively intervening in their children’s language development. Input patterns were also potentially different for

Patterson's subjects, as the minimum requirement for classifying a potential subject as "bilingual" was exposure to at least 8 hours a week of each language, a nominal amount that may, in some cases, have been the result of circumstance as opposed to active intervention. It is perhaps due to these differences—having seen that input quality and parental attitudes can have on the course of BFLA—that the mean reported vocabulary was lower in Patterson (1998) than those for the bi- and monolinguals reported on in the other major studies of productive vocabulary growth.

In spite of the minor differences seen across studies, likely due to sociolinguistic variables, the general summary provided by Bedore and Peña (2008) remains largely valid; that is: it has been found that, across languages, children learn their initial words at roughly the same age, and add words to their vocabularies at the same rates whether they are acquiring one or more than one language (p. 11), leading to a certain amount of confidence that monolingual norms can, to some extent, be used to evaluate expressive language delay in bilingual toddlers, and that a bilingual normative database is an achievable goal.

Another way in which bilinguals have been found comparable to monolinguals, is in the way they acquire and organize their early lexical system according to functional categories (Peña, Bedore, & Zlatic-Giunta, 2002); these groups of children appear to possess similar semantic abilities at similar ages, in terms of categorization and comparison (Bedore & Leonard, 2005). That is, the composition and richness of bilingual vocabulary, when viewed as a whole, is similar to early monolingual vocabulary.

Junker and Stockman (2002), for example, found that their German-English bilinguals kept up with the German and English monolinguals in terms of vocabulary richness, their earliest lexicons containing an average number of verbs that fell between the averages for the monolingual English and German groups (the difference between these groups suggested that cross-linguistic differences affect the facility of verb-learning in these two languages).

Because of the similarities found between the composition of comparably-sized bilingual and monolingual vocabularies at early stages, an analysis below will be made of our subject's early vocabulary composition in comparison to a those of Italian and English-speaking monolingual toddlers by Caselli et al. (1999), to see if any telling differences are apparent. Although the data from Italian and Spanish might be slightly different, typological and cultural similarities indicate that this is unlikely, and the extremely large number of subjects reported on in Caselli et al. (1999) makes it a more compelling normative database than those available for Spanish-speaking toddlers, with regards to composition.

3.1.2 What can we learn from early expressive abilities?

We have already seen that early expressive vocabulary can provide us with important clues as to how bilinguals process and acquire their languages: as a single or differentiated system (seen through TEs); in a balanced or unbalanced manner; with similar or different patterns from those observed in monolinguals. Perhaps most importantly, expressive vocabulary, one of the first observable phenomena in monolingual or bilingual speech, can serve as a tool for assessing language abilities from the very beginning of development. That is, we can observe whether or not a child's language acquisition is progressing at a normal pace and rule out (or not) the possibility of a language specific disorder. Pearson et al. (1993), Patterson (1998), and Junker and Stockman (2002), for example, all explicitly carried out their studies in order to help: "establish guidelines for identifying lexical delay in babies and toddlers" (Pearson, 1993, p. 94) which would serve as a possible "screening tool" (Patterson, 1998, p. 47) for identifying language impairment.

The link between early expressive vocabulary growth and language impairment has been discussed in many recent studies and can be summarized by the following: although many of the children with expressive language delay will eventually catch up with their peers, and can be thought of as "late bloomers" who are developing normally (if slowly),

there is also significant evidence that expressive language delay is a first sign of language impairment (Rescorla, 1997; Thal et al., 1997; Paul, 2001;).

Rescorla (1997) gives a review of the results from 5 large-scale studies of late talking toddlers and summarizes the outcome data as “strongly suggesting that toddlers who are slow to talk are at risk for continuing expressive language delay to age 3” (p. 558). Furthermore, data from Rescorla (1997) and Paul (2001) indicate that the later a child is identified as delayed, the more likely they are to stay delayed: that is, late talking 3 year-olds are much more likely to be later identified as language impaired, than late talking 2 year-olds. Although other researchers have questioned the extent that late talking can serve as early evidence of language impairment (Thal et al., 1997) the reverse argument is uncontroversial: it is clear that normal expressive language development naturally rules out the possibility of a language disorder.

Further analysis of the links between late talking and language impairment—as well as a closer look at the normative data used to define late-talking toddlers—will be provided below in chapter 7, and the findings from the studies by Rescorla (1997) and others will be used to assess our subject’s status and the necessity for further monitoring his future linguistic progress.

4. Specific Language Impairment

As the aim of this study is to identify (or rule out) the presence of specific language impairment (SLI) in our bilingual subject's speech, the final part of this theoretical section will provide an overview of specific language impairment—what it is, and how it is manifested cross-linguistically—and review those studies to date that have focused on specific language impairment in bilingual children.

4.1 SLI in monolinguals

Children with specific language impairment are described as having “a significant language deficit in the face of normal nonverbal intelligence, adequate auditory acuity, and the absence of gross neurological disabilities” Restrepo (1998, p. 1398). That is, they show limitation in language ability but show no signs of other factors that usually accompany language learning problems, such as hearing impairment or low IQ (Leonard, 1997); the only thing clearly abnormal about SLI children is that, unlike the “ideal child” mentioned in the introduction to this study, they don't learn their first language(s) rapidly and effortlessly.

Leonard (1997) estimates that about 7% of the population has SLI to some degree, noting that it is more common in males than females, and more common in children who have parents and siblings with SLI. Just like the rest of the children we have discussed so far, however, “the heterogeneity of language profiles in this population is considerable” (Leonard, 1997, p. 3). Overall, the language of SLI children can be generalized as having “late emergence and protracted development” (p. 86), and “an abnormal frequency of error” (p. 35). When compared to same-age peers, SLI children show limitations in every area of language that has been studied.

It has been observed that, across languages, children with SLI are typically late in acquiring their first words (Bedore & Peña, 2008)—Leonard (1997) cites a retrospective study of 71 SLI children that “indicated an average age of first words of almost 23

months, compared with an age of almost 11 months reported by parents of normally developing children” (p. 43)— and that essentially from the moment that a child’s communication is expected to take a verbal form (i.e. during the second year of life), signs of language impairment are evident.

During the period of lexical development, children with SLI tend to acquire their lexis in similar patterns as normally developing children (that is, with a preference for nominals and an initially low percentage of predicates), and make the same type of lexical errors (such as overextensions) as normally developing children (Leonard, 1997); however they are slower to acquire multi-word utterances than younger children with similarly sized expressive vocabularies, and their speech begins to show more noticeable deficiencies with the acquisition of morphosyntax.

Cross-linguistic studies of monolingual children with SLI have shown a number of basic similarities between SLI children regardless of language, such as the slower rate of vocabulary growth, word-finding difficulties, high error rates, and shorter, less complex utterances than same-age peers (Bedore & Peña, 2008). They acquire lexical items at a slower rate and, once multi-word combinations appear, tend to rely on the most frequently occurring lexis, including a preference for deictic language, and tendency towards conceptual simplifications (Penner, 2003; Bedore & Peña, 2008), in comparison with MLU-matched normally developing children (Jackson-Maldonado & Conboy, 2007).

4.1.1 Cross-linguistic differences in SLI

While morphosyntactic errors are higher than normal for all SLI children, the degree of similarity between speakers of different languages is lower at the morphosyntactic level, at which point similarities become relative to the typological distance between languages. A number of theories have been put forth to account for the morphological difficulties of children with SLI (these will be reviewed in more detail below in relation to bilingual SLI), however none has been able to account for all the characteristics of monolingual speakers across languages, making it necessary to identify the specific characteristics of

SLI for each different language (Leonard, 1997; Restrepo & Kruth, 2000). Leonard (1997) summarizes these findings by remarking that “children with SLI look first and foremost like speakers of the type of language to which they are exposed and only secondarily like rather poor speakers of that language” and thus “the characteristics of language that most sharply distinguish children with SLI from age or MLU controls will not be the same from one language to the next” (p. 117).

English-speaking children with SLI have been studied far more than any other group of SLI children, and it has been found that they have significant problems with verb use, particularly with the acquisition of past tense morphology (Rice et al., 2000), use of the copula, and the third person singular (Leonard, 1997; Restrepo & Kruth, 2000). They have additionally been shown to have difficulty with the production of pronouns, definite articles (Restrepo & Kruth, 2000), and occasionally with plurals and possessives, especially in low frequency forms (Bedore & Peña, 2008). Overall, English-speaking SLI children show the greatest difficulty with verb acquisition and morphology, acquiring verbs at a slower rate than normally developing children, and at a slower rate than other lexical items, often relying on a handful of the most frequently occurring verbs, with a particular preference for deictic language (Bedore & Peña, 2008).

Children with SLI who speak languages other than English have been found to have different grammatical difficulties relative to the characteristics of their language (Bedore & Peña, 2008). Hebrew-Speaking children with SLI, for example, have been shown to have difficulty with the definite prefix and accusative case markers, as well as with the unstressed morphemes that distinguish verb patterns, but do not appear to have the same difficulties as their English-speaking peers with the inflectional morphology that marks person, gender, and tense (Restrepo & Kruth, 2000). German-speaking children with SLI appear to have the greatest difficulty with case and gender agreement and seem to over generalize the verb-final syntactic pattern, however their errors are similar to English-speaking children in that they seem to include more substitutions than omissions (Restrepo & Kruth, 2000).

Children who speak Romance languages have morphosyntactic difficulties that lead to both omission and substitution errors, however their verb inflection abilities appear to be less affected than those of English-speaking children, and their greatest difficulties lie in other areas (Restrepo & Kruth, 2000). Italian-speaking SLI children, for example, appear to have the greatest trouble with clitics and definite articles (Leonard, 1997), particularly producing omissions of the definite article. French-speaking children with SLI, however, have been seen to omit tense markers on auxiliaries, main verbs and copulas, but do not seem to have the same problems with article use that characterize the speech of their Italian-speaking peers (Paradis & Crago, 2001). Spanish-speaking SLI children appear to have much in common with their Italian-speaking peers (Simon-Cerejido et al., 2007; Bedore & Peña, 2008), however the features of Spanish-speakers with SLI will be examined in greater detail in the next section, as the development of this group is the most relevant to the development of our subject.

4.1.2 SLI in Spanish-speaking children

Research on Spanish-speaking (SS) children with LI (henceforth, SSLI children) is relatively limited in comparison to that available for English-speakers, and the handful of available studies report evidence that, in some areas, appears to conflict; however, there is, to a certain extent, agreement that, like Italian-speakers, SSLI children do not appear to have the same degree of difficulty with verbal morphology as their English-speaking peers (Serra, Serrat, Solé, Bel, & Aparici, 2000). In contrast, their speech is characterized by “errors of number, tense, person, and gender agreement [particularly in the noun phrase], as well as omission and substitution of pronouns, articles, and prepositions” (Restrepo, 1998, p. 1400).

Restrepo (1998) found that SSLI speech was characterized by substitutions of articles and verb forms, and omissions of prepositions. Simon-Cerejido et al., (2007) also observed difficulties with article use, however they observed a higher frequency of omissions than substitutions. In a study profiling 48 Spanish-speaking preschoolers (24 with LI), Simon-Cerejido et al., found that the article omissions (along with clitic pronoun errors) was one of the best clinical markers of LI in SS children. Although there is disagreement over

whether omission or gender substitution is the most frequent error type, evidence across a number of studies indicates that the correct use of articles in noun phrases is among the most difficult skills for SSLI children to acquire (Jackson-Maldonado, 2007; Bedore & Peña, 2008). Evidence also indicates that article errors occur mainly in gender agreement, as opposed to in number agreement or the confusion of definite with indefinite articles (Restrepo, 1998).

Problem areas for SSLI children appear to include all noun-related morphemes, and particularly clitic pronouns. Bedore & Leonard (2001) studied 45 Mexican-American SS children, identifying 15 of these as having SLI (the specific error patterns will be analyzed in more detail below when analyzing data from our subject); they generally found that omissions and substitutions of direct object clitics (i.e., the *lo*, in the sentence “*el señor lo compró*”) were the most common and consistent error, results that were confirmed by Simon-Cerejido et al. (2007). Bedore & Leonard (2001) found that (a) plural clitics were more likely to be replaced by singular clitics than vice versa; (b) and they most errors were “near-misses”, in that they differed minimally from the correct form, meaning that, for example, masculine singular forms were the most frequent error on masculine plural items, with several key exceptions that will be discussed below (pp 915). Bedore & Leonard (2001) also found that the verb inflection errors of SSLI children were similar to younger MLU-matched SS children, and that, in general, verb errors differed from the correct form by a single feature.

To summarize data found across studies, it has been observed that, in comparison with age-matched Spanish-speaking peers, SSLI children perform poorly in the use of all grammatical morpheme types related to the NP, free-standing clitics, and make frequent errors with prepositions. Unlike in English-speaking SLI children, then, verbal morphology alone is not expected to be a good clinical marker for SSLI children, and attention must focus on the language-specific features that indicate abnormal development in SS monolinguals.

4.2 SLI in bilinguals

Although cross-linguistic studies of SLI have shown the different characteristics of SLI across languages, it remains unclear whether these characteristics might be altered in a bilingual individual, as a result of the processes of acceleration, deceleration, or transfer discussed above. Paradis et al., (2003) engage with this question, noting, “it would be of both theoretical and practical interest to know whether or not bilingual children with SLI could be considered ‘two monolinguals in one’ with respect to the grammatical deficits they display in their two languages” (p. 113).

The greater variability in bilingual acquisition makes it even more difficult to identify children who are deviating from norms at early ages, and the sociolinguistic and cross-linguistic influences on early bilingual speech may cause them to appear deviant from monolingual norms even when no language disorder is present, making it difficult to appropriately assess bilingual development; for example, although it is assumed that bilinguals will score lower than monolinguals peers on certain measures, it is not clear how much lower they would need to score for that lag to be seen as evidence of language impairment (Thordardottir et al., 2006).

Theoretical accounts of LI may, to some extent, inform our interpretation of the extent to which bilinguals and monolinguals can (and should) be compared. The major hypotheses regarding SLI can be divided into two categories: linguistically based accounts and processing-based accounts. In the former, the assumption is that there are generalized delays in language development and SLI children are unable to formulate specific aspects of their native language. One example of a linguistically based theory is the Extended Optional Infinitive Account (Rice & Wexler, 1996) that assumes children are unable to represent the functional categories related to inflection and agreement, which leads to the tense difficulties seen in English, and the clitic difficulties seen in Romance languages like Spanish and Italian (Bedore & Leonard, 2005). In processing-based accounts, the assumption is that children have SLI because they process linguistic information less efficiently than normally developing children (Bedore & Peña, 2008). One example of

this type of theory is the Surface Hypothesis developed by Leonard (1997), which suggests that morphological deficits arise when weaknesses in general processing capacities interact with the linguistic characteristics of the child's language(s). This means that forms with low salience are the most difficult for LI children to learn (for example the regular past *-ed* and the third person *-s* morphemes in English) and that they require more input to appropriately acquire these structures. The linguistically based accounts suggest that LI bilinguals might be similar in each of their languages to monolingual peers, whereas the processing accounts would suggest an even more protracted development in LI bilinguals as the amount of input they receive in each of their languages is naturally less than that received by monolinguals.

Unfortunately, the vast majority of research to date on bilingual children deals with the development of typically developing children (Junker & Stockman, 2002) and so it is difficult to compare a bilingual who may have SLI with age- and language disorder-matched peers. Furthermore, before diagnosing bilinguals with SLI, one must “disentangle normal language variation that arises from exposure to more than one language from language divergences due to LI” (Bedore & Peña, 2008, p. 12). A different version of the same problem has, to some extent, been observed in studies of SSLI children in communities where Spanish is a minority language, however this field has offered more negative than positive models with regards to resolving the difficult “difference vs. disorder” question. (Jackson-Maldonado & Conboy, (2007), for example, reported that studies of American SSLI children's gender-agreement errors had ignored the potential effect of the input the children were receiving, from interlocutors who were at least partly bilingual (p. 121), but cited no follow-up studies that had adequately addressed the issue of language contact).

While the available studies of bilingual children with SLI do seem indicate that these children are similar to their monolingual peers (e.g., Paradis et al., 2003), the lack of normative data for languages other than English, and the lack of knowledge as to how bilingualism may interact with SLI still puts bilingual children at risk for both over- and under-diagnosis of language disorders (Goldstein, 2006). Although many questions

remain answered, the last few years have seen an increased awareness of the difficulty of assessing bilingual SLI. Bedore & Peña (2008) provide an excellent review of the research currently available on bilingual SLI, and report a number of details that may be seen as the ground floor of this developing normative database: for example, it appears that bilinguals with LI have vocabulary deficits in both languages; similar word-learning and word-finding difficulties as monolinguals with SLI; and lexical/semantic difficulties that are comparable across languages (p. 15).

Although the amount of research on bilingual SLI is limited, it is fortunate for this study that the majority of this research has focused on Spanish-English bilinguals, mostly with clear Spanish-dominance, and thus can, in many cases be compared to our subject. While these studies have included subjects with a range of ages and sociolinguistic backgrounds, it has generally been found that bilingual Spanish-English children with SLI tend to show similar signs in each of their languages as do monolingual Spanish and English speakers with SLI (Bedore & Peña, 2008). Several studies that have addressed bilingual Spanish-English SLI will be summarized below—although the relevant quantitative data will be presented below in the empirical portion of the study, in comparison to our subject.

The first of these studies, by Restrepo (1998) analyzed the speech of 62 children from 5 to 7 years old, 31 of whom were identified as having language impairment, looking for the clinical identifiers that could discriminate between the two groups. Her children were described as “predominantly Spanish-speaking”, as they used Spanish as their primary language in both home and school environments, however they were all living in the United States and at various degrees of exposure to English, thus making the majority of them at least passively bilingual. The 31 children identified as SLI were referred from Spanish-English bilingual speech language pathologists (SLPs) in the United States, and the diagnosis was cross-referenced with parent and teacher questionnaires indicating concern regarding the children’s language skills. Spontaneous language data in Spanish was collected and coded, identifying the number of errors per T-unit (“any clause and its subordinate clauses” p. 1402), and the data was analyzed for group differences with

regards to morphosyntactic variety and errors types; two controlled tasks were also administered to measure the children's abilities at novel word learning and novel bound-morpheme generalization.

The study identified 4 measures that accurately discriminated 79% of the LI children from the larger group: parental report of their child's language problems; family history of the same; mean length of T-unit (MLTU); and number of errors per T-unit. With regards to the MLTU measure, it was found that the SSLI children used less complex measures than the rest (concordant with data from studies of monolinguals with SLI); and with regards to the number of errors per T-unit, it was found that the SSLI group had an average of .39 errors per unit, as compared with just .09 for their normally developing peers. They favored the latter measure as one of the best single discriminators for SLI, but recognized that standard MLU counts could be acceptable for younger (pre-school aged) children, which is the measure they we will adopt in the study below.

Jacobson & Schwartz (2002) also aimed to identify the clinical markers that discriminate for bilingual SSLI, with a slightly younger age group; their subjects ranged from 4 to 5 years old and were described as "incipient bilingual" Spanish-speaking children. Their 20 participants, 10 of whom had been identified as having language impairment, had been living in the United States for at least a year at the time of the study, but came from Spanish-speaking families. Parents for all subjects reported that Spanish was the child's first language, and used at least 75% of the time in the home, but that many of the children used English in school and heard English at home from television programs.

Data from these "bilingual" subjects was analyzed with regards to clitic pronoun use in Spanish (using a structured task in which clitic pronouns serving as direct objects were elicited). It was found that the children with SLI used clitic pronouns less frequently and were less accurate in their use of gender agreement for clitics, giving them similar profiles to those of monolingual SSLI children, in spite of their contact with English and "incipient bilingual" status. Their "typically developing" incipient bilingual peers did not exhibit the clitic omission or shift from preverbal to post-verbal clitic placement that was

observed in the SLI bilinguals, indicating that (incipient) bilingualism was not the cause of the errors observed in the SLI group; that is, these errors were indeed disorder, as opposed to difference. Jacobson & Schwartz shed further on the possibility that language contact or language loss (of Spanish) affect clitic production, finding no correlation between the amount of English reportedly known and used by the child and the number or type of errors observed (p. 37).

Finally, essentially the only study to date examining both languages of a full-fledged Spanish-English bilingual with SLI, is a case study by Restrepo & Kruth (2000) comparing the language development of two 7-year-old girls (one identified as having language difficulty, the other identified as “normally developing”; both had similar amounts of contact with their two languages, lived in the United States with Spanish-speaking families, and attended English-speaking schools). The researchers collected spontaneous language data for the girls in both languages and analyzed differences between the two, looking for patterns of development in each language and the rate and types of errors made by each girl in both the “first” and “second” language (early exposure to English in the community makes it unclear whether this should be viewed as simultaneous or sequential bilingualism, but both girls were exposed to increased amounts of English input upon entering the school system, and, according to their parents, this marked a clear increase in their productive use of English).

It was found that the SLI child, Diana, whose parents reportedly noticed language difficulties from the time she was 2 or 3 years old, had experienced a shift in language dominance after beginning school in English, as evidenced by a lower Spanish MLU, and her parents were considered that her Spanish-language skills were deteriorating; in contrast, Hilda, the normally developing child, did appear to have experienced any language loss in Spanish, and was rapidly mastering English morphological skills. Spontaneous language samples were taken from both children in English and in Spanish, and it was found that Diana produced more errors per utterance in both languages, the most significant predictor of SLI seen thus far.

In English, it was observed that Hilda used far more verb types, prepositions and pronouns than Diana, and that she produced higher percentages of conjoined and complex sentences (83% of Diana's sentences were simple); overall, Diana demonstrated the same limited abilities in verb use, tenses, pronouns and prepositions that characterized English-speaking SLI children. In Spanish, it was observed that Hilda made very few grammatical errors, whereas Diana made many (.78 errors per T-unit in the first sample), and that, again, Diana produced primarily simple sentences whereas Hilda produced more complex structures. Furthermore, Diana seemed to demonstrate similar grammatical deficiencies in Spanish as those seen in monolingual SSLI children, particularly with regards to definite articles, pronouns and prepositions (the most frequent error occurring with production of the definite article), whereas the normally developing child, Hilda, did not have difficulties in these areas.

In summary, SLI showed an effect on both languages of the bilingual subject studied, but the normally developing bilingual child did not make comparable errors in type or frequency, even in her weaker language. The study was undertaken in part to combat a theory that bilingual children with SLI might be difficult to differentiate from bilingual children without SLI, and effectively showed that there are observable quantitative differences between them, at least by the age of 7. It also helped shed doubt on the idea that bilingual children might appear to be language impaired in their second or weaker language, as the characteristics of each girl's English were markedly different.

In the empirical portion of this study, we will use information gleaned about bilingual development and the characteristics of SLI in English and Spanish, to the extent that they have been observed as applying to bilingual children, to evaluate the speech of a our subject: a 4 year-old Spanish-English bilingual for whom we have early evidence of language difficulties.

Part II. The Study

5. Methods and Procedures

5.1 The case study method

As discussed in the theoretical section this study, BFLA includes a long history of case study research, in which naturalistic observation of one or two subjects is used to provide an example of what bilingual development can look like. In large part this method is prevalent because of the difficulty of finding multiple subjects who share similar linguistic and sociolinguistic profiles, however one can argue that the method remains highly useful in BFLA: as a young field, greater amounts of naturalistic data are necessary to allow researchers to make plausible, testable, hypotheses about a number of phenomena (see De Houwer, 1990 for an excellent defense of the case study method). A detailed, naturalistic study of one subject allows us both to identify new hypotheses that might be extracted and tested on a larger group, and to test standing generalizations about bilingual development in a reliable way.

5.2 The Subject: Overview of familial and linguistic environment

The subject of this study, Leo, was born in Barcelona, in the Hospital del Mar on July 23, 2004. His mother, an American originally from California had been living in Spain (first in Ibiza and then in Barcelona) for slightly over 10 years at the time of Leo's birth. His father, originally from Uruguay, had been living in Barcelona for 3 years at the time of Leo's birth. Leo is the family's first child, and from the beginning of his life he has been exposed to both English and Uruguayan Spanish at home on a regular basis, thus qualifying him as a simultaneous bilingual.

Leo's mother is a self-employed musician, who also gives private English classes to young children; at the beginning of this study she had only a high-school level education, but in 2006 took a secretarial course to gain access to the university, and in 2007 began a university degree in education, hoping to eventually teach music in the public school system. His father's secondary education includes professional training in computer

programming, and he has worked as a salesman in an electronics store and then as a software assistant during this study.

For the first 3 years of LEO's life, the family lived in the Gothic quarter of Barcelona. This neighborhood is the center of Barcelona's thriving tourist industry, and the amount of tourists on the street at any given hour of the day means that one hears a vast mix of foreign languages, in addition to Castilian Spanish and Catalan (the city's two official languages). During this time, the family rented out two rooms in their flat: one to an Argentine woman, who was an occasional caregiver and frequent adult interlocutor; the other at different times (first for 3 months, and then for almost a year) to a German friend of the mother's who interacted with the child and mother almost exclusively in English. In the final year of the study, the family moved to a smaller flat in the significantly less touristy neighborhood Les Corts, and the child's exposure to Castilian Spanish and Catalan (on the street, and in the neighborhood parks) increased accordingly. Because the move, which coincided with the start of pre-school, led to significant changes in Leo's linguistic environment, including a shift from bilingualism to multilingualism, these two periods will be discussed and analyzed separately.

5.2.1 From birth to age 3

Leo's mother has, since his birth, expressed a desire to use English (her native language) with Leo, and in informal interviews throughout the first 3 years claimed that she "almost always" spoke to Leo in English. However, even during the first year—before Leo was producing words and able to have an active role in negotiating the language context—it was observed that while the mother addressed Leo primarily in English *in the home*, she frequently resorted to Spanish when out on the street, or in the park where they spent much of their time. This was briefly discussed in previous studies (Barquin 2006; 2007), and the disconnect between the mother's declared desire to use English and her extensive use of Spanish may have several different explanations: the first may be that her 10 years in Spain have caused a certain amount of attrition and a reduced comfort level with her native language; a second possibility is that she instinctively sought to accommodate the monolingual Spanish-speakers who were frequently present outside of the home, even

when addressing the child; and a third possibility is that she had a preference for speaking the community language in public after years of being a foreigner who has found it challenging to integrate into mainstream society; this preference for Spanish as the “public” language may have been compounded by the fact that the family’s immediate neighborhood was (and is) one of the worst in Barcelona with regards to petty crime, of which targets foreign tourists are often the target.

In all likelihood, the mother’s Spanish use arose from a combination of all these factors; regardless of the cause, it significantly detracted from her role as the primary supplier of English input, and although Leo probably spent close to 75% of his waking hours alone with his mother during the first three years of life, it is estimated that he received less than 50% of his input in English, and he was well aware, from before the onset of productive speech, of his mother’s bilingual identity. During these first years, the child only had significant contact with monolingual English-speakers for two short periods: a month-long visit from his American grandmother (beginning slightly before his second birthday at the end of July); and a month-long trip with his mother to California that same September.

In contrast, during this period Leo frequently interacted with monolingual Spanish-speakers, including his father, who has a minimal knowledge of English. Additionally, the family spent the month following Leo’s 3rd birthday (directly before the move) in Uruguay visiting the father’s family, which provided the child with an increase in Spanish input, and a more monolingual context than he had yet been exposed to: that is, without the mix of languages he was accustomed to hearing on the streets of his neighborhood in Barcelona. During this time he also heard a larger-than-usual proportion of Spanish from his mother, as they spent less time alone and were usually in the company of his monolingual grandmother, which put social pressure on the mother to communicate in the commonly understood language.

5.2.2 Age 3 to 4

At age 3, following the move, Leo began attending a private pre-school where his linguistic horizons broadened considerably. The two teachers are Catalan-speakers who primarily address the children in Catalan, however the majority of other students are from German-speaking families, because the school follows an educational philosophy developed in Germany—similar to the Montessori program, in that the age groups are mixed and the children are given a great deal of freedom to learn at their own pace. The choice of school is perhaps evidence of the parent’s lack of conscious strategies to promote Leo’s bilingual development, or at least the socio-economic circumstances that have prevented them from prioritizing bilingualism. Leo was ineligible for a spot in the public nursery school of choice due to the family’s move, and this particular private school is considerably more affordable than other private schools, because it was developed as a cooperative; informal conversation with the mother gave no indication that she considered the fact that the child would not be receiving input in either of his two first languages (and would be exposed to two new languages) before enrolling him in the school.

Because after the age of 3 Leo’s linguistic profile is no longer that of a *bilingual*, but one of a *multilingual* exposed to at least 3 languages on a regular basis during the week, data collected during the last year falls somewhat outside the scope of the present study. While certain general trends and phenomena will be discussed to the extent that they can be used to assess Leo’s speech for language delay or disorder, no real discussion can be made of Leo’s abilities in his two “second” languages, because data was only collected in English and Spanish-speaking contexts. It remains unclear whether or not the child has significant skills in either Catalan (the language of school) or German (the language of many of his friends). Discussion with a German family friend (the one who had previously shared a flat with the family) revealed that, shortly before the child’s 4th birthday, his attempts to engage the child in conversation in German were unsuccessful, and the friend’s impression was that the child didn’t understand him in German, but this observation must be noted with caution, as the friend had previously spoken English with the child, and therefore the child must simply have been unwilling—as opposed to unable—to engage in a conversation in his fourth, and weakest, language with an

interlocutor who he knew spoke both English and Spanish; on the other hand, the child's generally weak language skills, even in his first languages, make it easy to believe that he hadn't yet acquired any German skills in spite of his exposure at school.

Catalan began to appear occasionally in the last data collection sessions, mostly in the form of certain expressions (particularly the names of songs and games) for which he had no Spanish or English equivalent, but Catalan exposure also appears to be having an effect on Leo's pronunciation of certain words in Spanish, as well as a small amount of lexical borrowing. Any observations made about Catalan, however, are entirely speculative: no reliable information is available with regards to the child's overall skills in Catalan; to assess these skills further study would need to include data collection at school, in the Catalan context; unfortunately the presence of other children and necessity of parental consent when recording video data make this a somewhat complicated process and a task that has thus far been left pending.

This last year also marked a further reduction in the child's exposure to English, as the hours he spent with his mother were reduced by the time spent in school, and because three days of the week the mother took care of another child, Ushia, the daughter of Spanish-speaking friends, and spoke mostly Spanish when addressing the two children together, although she claimed she continued addressing Leo himself in English. One might tentatively estimate that during the last year Leo's exposure to English fell from slightly less than 50% to 25% or less of his waking hours.

5.3 The corpus

The corpus for this study includes video-recorded spontaneous language data spanning 2 years and 3 months. Data collection began as part of two previous studies (Barquin, 2006, 2007) examining Leo's productive language use up to age 3, which will be discussed in detail in the following section. The present study reexamines these early sessions and includes 8 additional sessions collected during the four months leading up to Leo's 4th birthday (sessions t21-t28 in the table below). Overall, this study works with the corpus of 28 videotaped sessions, presented below in Table 1:

Data Collection Time	Child's Age	Adults present
1	1;09.08	M; F; R
2	1;10.03	M; R
3	1;10.25	M; R
4	1;11.15	M; R
5	2;00.00	M; G; R
6	2;00.12	M; G; R
7	2;02.27	M; R
8	2;03.11	M; R
9	2;03.29	M; F; R
10	2;05.25	M; R
11	2;06.11	M; R
12	2;06.24	M; R
13	2;07.24	M; R
14	2;08.23	M; R
15	2;09.08	M; R
16	2;10.05	M; R
17	2;10.16	M; R
18	2;11.02	M; R
19	2;11.11	R
20	3;00.00	M; R
21	3;07.25	M; R
22	3;08.02	M; R
23	3;10.08	M; R
24	3;10.11	R
25	3;10.25	R
26	3;10.27	F; R
27	3;11.17	R
28	4;00.00	R

Table 1: Recording Sessions; M=Mother; F=Father; R=Researcher; G=Grandmother

5.3.1 Data collection

All recording sessions took place in the family's home, and lasted between 30 and 60 minutes. The bulk of the sessions observed the child playing with his mother, in a mostly English-speaking context, although the father was present during some of the early sessions (he was in the apartment but not actively interacting with the child, with few exceptions), and in several sessions the child's English-speaking grandmother was present, and an active participant in the play session.

The researcher was present during all recording sessions but tried, whenever possible, not to directly interact with the child or other adults, except in the final phase of data collection (t21-t28), when several sessions were arranged in which the child and researcher were alone so that the researcher could attempt to negotiate a monolingual context of interaction and get a clearer picture of his abilities in English (at this point he mostly responded to his mother's English utterances with Spanish, but it was unclear if this was due to a lack of English abilities or simply a natural preference for his dominant language in a context where either language was accepted).

Recording always began at least 5 minutes after the child and adult(s) were engaged in play, usually with blocks, cars, or picture books. Some sessions included "breaks" in formal play in which the child was eating, being groomed, being disciplined, etc., but these were deemed valuable contributions to the data, which aimed to capture naturalistic interactions between the child and his regular caregivers.

5.3.2 Previous studies

Two previous studies on this subject (Barquin, 2006; 2007) respectively analyzed two different aspects of this child's early development: evidence of language differentiation in the form of translation equivalents (TEs), and the effect of parental input on language mixing. The data collected for these studies (up to the child's 3 birthday), including the informal parental interviews and researcher's observations that were collected in an ongoing manner up until the child's 3rd birthday, must be considered a part of the present corpus of study, as they form the backdrop to our analysis and inform our understanding of Leo's development overall.

Data collection for the first study began when Leo was 1;09, following the appearance of his first words, and continued for three months, until Leo was 2. This study, preliminary in nature, addressed the acquisition of TEs in Leo's earliest productive speech, finding that his first true equivalent appeared directly following the arrival of his monolingual grandmother and concluding that this visit may have marked the beginning of his

awareness of exposure to two separate linguistic systems. At age 2, however, the end of the period analyzed Leo had still not acquired 50 productive words, and so it was deemed impossible to gauge whether evidence for differentiation could be found in pragmatically appropriate language choices.²

The second study picked up where the first left off (after Leo's second birthday), and analyzed the child's mixed speech to determine whether pragmatically appropriate language choices could be observed, which would provide further support for the hypothesis that the child was able to differentiate between his two linguistic systems at this early stage. This study followed the child's development up to the age of 3 (stopping right before the trip to Uruguay and the many changes discussed above) and focused on the Leo's mixed utterances in English contexts. It was observed that the lack of conscious parental strategies to promote monolingual English contexts were leading to increased Spanish dominance and, interestingly, to an increase in mixed input from his mother: that is, she began to use more Spanish to accommodate his clear preference, as opposed to the other way around. It was hypothesized that if these trends continued, the child would develop as a passive bilingual (with little to no productive skills in English), and might even be at risk for losing command of English altogether. The further changes that have reduced his input in English since the time of the last study, unfortunately, render it even more likely that he will fail to develop significant productive skills in English unless there are environmental changes or a concerted adult effort to expose him to more English.³

² This study was submitted to fulfill course requirements for the doctorate "Comunicació Multilingüe", and thus focused only on this short, though crucial, initial phase of language development.

³ The present status of this hypothesis can be seen in chapter 8, in our examination of language dominance.

5.4 Procedures

5.4.1 Transcription

All sessions were first transcribed using Microsoft Word, soon after they took place, in a shorthand developed by the researcher and included relevant notes and the researcher's impressions, as a sort of running diary. A substantial selection of transcriptions, those deemed most relevant for this study, were then re-transcribed, returning to the original video for reference, using the CHAT transcription format developed by MacWhinney (2000) as part of the CHILDES project.

The advantages of this format are that (a) the data can then be analyzed by the CLAN program discussed below; (b) all CHAT transcribed data can be uploaded into the CHILDES database and be used by other researchers, thus further enriching the case study method; and (c) the format makes use of well-studied conventions that promote clarity and readability (see MacWhinney, 2000, p. 18), which in turn allow the researcher and others to look at a CHAT transcript and get a real idea of the communicative situation and child's speech. The disadvantages are that the relatively strict conventions force the researcher to make certain decisions about the ambiguous moments that inevitably arise in natural speech. That said, any method for transferring the dynamic and multi-faceted phenomenon of natural speech to the two-dimensional medium of pen and paper, has certain limitations; the advantages of CHAT, particularly when viewed in tandem with the CLAN program, outweigh the disadvantages, and render it, in this researcher's opinion, the best method to date of transcribing child language.

To assess disfluency, the original CHAT transcripts were re-transcribed from the videos, and disfluency errors were coded according to the system of categorization that is provided in chapter 10 (table 19) and reproduced in Appendix II. Conventions regarding the transcription of partial words, word and syllable repetition, blocks, revision, and phrase abandonment were taken from the manual by Bernstein Ratner, Rooney, & MacWhinney (1996) entitled "Analysis of stuttering using CHILDES and CLAN".

A selected list of the codes and symbols used in this study's transcripts and a sample transcription will be given in Appendices I and III; together they provide an excellent picture of the nature and capabilities of the CHAT format.

5.4.2 Tools of Analysis

The CHAT format requires that a number of decisions be made during the transcription process, and so transcription marks the beginning of the analysis process in many ways: for example decisions must be made as to how to transcribe semantically ambiguous material, and how to label material like exclamations, interjections, onomatopoeia, and babble or invented forms; depending on the labels given, for example, these items may be counted as "words" that contribute to the child's MLU-w, or as "non-words" that are ignored in these counts. The most difficult task in the transcription and analysis of this child's speech was due to the child's weak phonological abilities; utterances were often listened to upwards of 10 times before a decision was made as to how to best record the syllables in question; when repeated listening (and, occasionally, the second opinion of colleagues) still made it impossible to map an adult form onto the child's word, it was transcribed as "xx"; strings of more than one unidentifiable item in an utterance were transcribed as "xxx" (see MacWhinney (2000) for an explanation of the repercussions of these two labels) .

Once a transcript was complete, the computer program CLAN was used to extract quantitative information about the child's language use. Some examples of the types of commands used were those that: calculated the child's MLU in words; extracted lists of the word types and tokens that appeared in each section; extracted the child's longest utterances for each time period studied; and extracted the frequency of specific phenomena in the child's speech.

A separate program, "jscrip" was designed specifically for this study in order to analyze the child's disfluency, as a weighted measure of errors per utterance, during the final period of data collection. The use of automated systems to analysis the transcripts and extract quantitative data was an essential tool for the present study and provided a greater

amount of reliability than past studies that relied on manual counting or estimates based on a limited sample for calculations such as MLU.

5.4.3 UNGRAMM

For the calculation of UNGRAMM, an ungrammaticality index that will be explained in depth in section 10.2, for Spanish-language data, the transcript was first reviewed and coded for errors by the primary researcher, who is a bilingual speaker of English and Spanish, but acquired Spanish as a second language. To insure the validity of grammaticality judgments, the same sample was reviewed and coded by a second researcher, a native-speaker of Mexican Spanish. Disagreements were identified and resolved through discussion and detailed evaluation of the context of the utterance in question.

5.5 Design

This study makes use of several distinct pieces of our overall corpus in order to analyze the distinct areas of development that will help us arrive at an assessment of SLI. The first phase area of development examined is the acquisition of early expressive vocabulary, in order to see if Leo is a “late talker” by clinical standards, and if there are any characteristics of his earliest vocabulary that indicate whether or not he is otherwise on par with his bilingual peers, and likely to “catch up” later in development. To assess Leo’s early productive lexicon, data is analyzed from the sessions t1-t8, as seen below in table 2:

Data Collection Time	Child’s Age	Adults present
1	1;09.08	M; F; R
2	1;10.03	M; R
3	1;10.25	M; R
4	1;11.15	M; R
5	2;00.00	M; G; R
6	2;00.12	M; G; R
7	2;02.27	M; R
8	2;03.11	M; R

Table 2: Corpus for Phase I

The second stage of analysis deals with the later phases of language development; the goal is to establish language dominance, and then attempt to identify signs of SLI in each language. The overall corpus for this stage included 6 of the 7 sessions closest to Leo’s 4th birthday. One of these sessions (t23) was not included due to the inordinately high amount of unintelligible material, which made it too difficult to reliably assess the child’s speech (this was the first and only session that was recorded outdoors—as Leo wanted to play with his toys on the roof—and the sound quality was quite diminished as a result). Sessions t22, t24, t25, t27, and t28 are analyzed for signs of SLI in English, and t26 (the session in which Leo is interacting exclusively with his monolingual father) is analyzed for signs of SLI in Spanish. The corpus for the second stage of analysis (carried out in chapter 9) is given below in Table 3.

Data Collection Time	Child’s Age	Adults present
22	3;08.02	M; R
23	3;10.08	M; R
24	3;10.11	R
25	3;10.25	R
26	3;10.27	F; R
27	3;11.17	R
28	4;00.00	R

Table 3: Corpus for Phase II

Finally, the analysis of disfluency carried out in chapter 10 examines a reduced corpus of the three final data collection sessions: t26-t28 (see Table 4).

Data Collection Time	Child’s Age	Adults present
26	3;10.27	F; R
27	3;11.17	R
28	4;00.00	R

Table 4: Corpus for Disfluency Analysis

6. Phase I: Expressive development from 21 to 27.5 months

As a whole, the first 8 data collection sessions (T1-T8) fully document Leo's expressive vocabulary in both languages from 21-27.5 months, providing us with a data set that we can compare to monolingual and bilingual peers (most usefully, with the data reported by Patterson (1998) for 102 bilingual Spanish-English toddlers of the same age range) in order to establish lexical delay. Below Leo's early productive skills are described in terms of lexicon size, composition, and rate of growth, and his word combinations are illustrated by MLU and the longest recorded utterances. These data are then compared to applicable norms.

****A note on word counting***

To count Leo's productive lexicon, a word was considered to be "a meaningful utterance that has been used at least twice to refer to the same concept" (following Lanvers, 1999: 38). The videotapes were scrutinized for those words that were confirmed by 1) subsequent repetition 2) supporting contextual information and 3) parental recognition. Because of the unreliability of the parental reports that were initially intended to compliment the video data (see Barquin, 2006), words were only added to the total lexicon when they appeared in the presence of the researcher and/or on the videotapes; while this created problems for calculations of total lexicon at later ages, during the age range reported here the child's lexicon was so small that all of his words were used repeatedly and it was evident that Leo's on-camera repertoire fully represented his total vocabulary.

****A note on pronunciation***

The child's pronunciation often led to difficulties in identifying the first appearances of certain lexical items, however once a word was judged to be a meaningful referent (based on the understanding of the researcher, other adults present, contextual evidence, and consistent repetition) it was recorded as the adult form (except where expressly noted),

and phonetic development was deemed beyond the scope of the present study, except to the extent that it affected his overall unintelligibility and perception of disfluency, which will be discussed in Chapter 10. The sole phonetic variation from adult norms that is recorded here was for words in which he consistently swallowed the same consonant or syllable; in these cases CHILDES transcription conventions were followed, and parenthesis were inserted around the typically eliminated sounds: e.g. *mo(re)* indicates that the child pronounced the word as “*mo*”.

6.1 Total Productive Vocabulary:

When recording first began at age 1;09.00, or 21 months, Leo had only three meaningful concepts in his expressive vocabulary: yes (always “yeah”), no, and *pan*, the Spanish word for bread, which was overextended to apply to all food and used when the child was hungry. During the next 6 and a half months, until the age of 2;03.11 (or, slightly less than 27 and a half months), his productive vocabulary grew to include 64 unique lexical items, including several child-invented forms (e.g. *cabia* to refer to a ‘*caballo*’ the Spanish word for horse; *pipa* to refer his pacifier) that were consistently linked to specific concepts, and the child’s own family nickname, *Mamo*. The child’s full productive repertoire from 21-27.5 months is shown in Table 5, on the following page, with the appearance of the word in a specific column (t) indicating the time at which the item was first officially recorded as part of the productive lexicon.

t1=21 (1;09.00)	t2=22 (1;10.00)	t3=22.25 (1;10.25)	t5=24 (2;00.00)	t6=24.5 (2;00.10)	t7=27 (2;02.27)	t8=27.5 (2;03.11)
English						
yeah			apple mo(re)	baby (ba)nana book happy shoe	all gone bike car down me	cow hello moon owie up
Spanish						
pan	alli se cayo	caca ma(s) ya (e)sta	agua alla ciao da dos y tres el ese eso esto hola mira nene quiero si y yo	aca aqui gato otra pie toma vamos	a(d)ios asi cabia [=caballo] gol moto piopio [= bird] que	loco pipa [=pacifier]
NLS*						
no	bowwow mamo meowmeow	mama papa quackquack		peepee		
Totals						
3	5	6	18	13	12	7
3	8	14	32	45	57	64

Table 5 Total expressive vocabulary from 21-27 months.⁴

*NLS refers to 'Non-Language Specific' items

⁴ The totals given are the number of new lexical items recorded at each (t), followed by the cumulative number of items in the child's total expressive vocabulary (in bold face) at that point.

****A note on routine language and frozen phrases:***

Several items in the child's productive lexicon at this point included 'frozen phrases' (e.g. *ya esta; all gone*), which were recorded here as single items because evidence indicated that they were viewed by the child as such: they were used consistently as units to refer specific referents or events, and their separable parts had not, for the most part, occurred in isolation at any point before the frozen phrase was observed. In the case of the phrase *dos y tres*, the child had produced other coordinated phrases using the conjunction "y" (e.g. *papa y mama*), but the specific context in which this phrase appeared (as an exclamation used before jumping or throwing something) led to its classification as 'routine language' most appropriately classified as a single lexical item. The treatment of frozen phrases as routine language was modeled by Jackson-Maldonado (2003), in a large-scale study on the acquisition of Spanish-speaking toddlers.

The frozen phrase *se cayó*, containing the reflexive object clitic *se*, caused a certain amount of doubt, since prior studies and general logic recommend separating Spanish clitics from verbs in transcription for grammatical analysis (e.g. Jackson Maldonado 2003, Patterson 1998), and they were, in fact, counted separately for MLU and syntactic analysis. However, for the analysis of expressive lexicon *se cayó* was treated as a single item for the same reason as the other frozen phrases: although the verb *cayó* sometimes appeared alone, the clitic *se* never appeared with any other verb or in isolation and analysis indicated that *se cayó* and *cayó* were used interchangeably by the child, regardless of the grammatical and discourse rules that govern their use for adult speakers, leading to the hypothesis that the appearance of *cayó* in isolation was actually deceptive, and was likely the result of phonological ease; that is, the child occasionally swallowed the "se", which was, for him, the first "syllable" of a single word. (This same phenomenon was observed with the frozen phrase *ya esta*, which was shortened in the child's pronunciation as *ya sta* and *sta*; the latter was so common that 'sta' was

frequently mimicked in the adult speech around him, and eventually became something of a “family word”.⁵

6.2 Composition of lexicon

6.2.1 Composition by language: early evidence of Spanish dominance

At the age of 27.5 months, Leo had 64 unique lexical items in his productive vocabulary. Of these 64 words: 38 were classified as belonging to Spanish, 18 to English, and 8 were classified as non-language specific (NLS) items because they were onomatopoeic and/or are pronounced so similarly in Spanish and English (e.g. *peepee/pipi*) that they were impossible to reliably classify as one or the other. Spanish items, then, made up 59% of the child’s total expressive lexicon, whereas English items accounted for only 28%, reflecting the early dominance of Spanish.

6.2.2. Composition by category: comparison to available norms

Following the broad classifications of the MacArthur CDI and LDS surveys, and the labeling system devised by Caselli, et al (1995) in a large-scale study of early vocabulary composition, Leo’s first 65 words were classified as being either: (a) nominal-- including common nouns, proper names, and onomatopoeic words used for naming purposes; (b) non-nominal—a broad category including routine language such as *hi*, *all gone*, *up* (with outstretched arms to be lifted up), and functors (pronouns, deictic language, question words, etc); (c) predicates—a category combining lexical verbs and adjectives. Table 6 (on the following page) provides a breakdown of the numbers and percentages of each category of items across languages in his first 64 words:

⁵ Please see MacWhinney (2000) for a detailed description of family words, child forms, and other special categories in child language.

Category	Language	Total #	Percent
Nominals	English	17	65%
	Spanish	18	39%
Routines	English	8	31%
	Spanish	21	46%
Predicates	English	1	4%
(Verb + Adj)	Spanish	7	15%

Table 6: Composition of Leo's Productive Vocabulary as a Function of Language and Total Vocabulary Size

In the cross-linguistic study carried out by Caselli et al. (1995), the first 50 words produced by 659 English-speaking and 195 Italian-speaking infants were compiled and analyzed by functional category. They aimed to investigate whether the reported 'verb-noun' shift and the relative lack of predication in the earliest child language was true for non-English-speaking infants, and particularly for infants exposed to a romance language like Italian, in which verbs are reported to have greater salience. It was assumed that Spanish and Italian would behave similarly in this respect and that, although Caselli's (1995) subjects consisted of two groups of monolinguals, their first 50 words in each language would be interesting to compare to the first words in Leo's total vocabulary, and vocabulary in each language. Table 7 provides a summary of these results:

		#Words Produced					
Category	Language	1-5	6--10	11-20	21-50	>50	Total
% Nominals	English	80.4	75.4	70.7	72.8	73.6	75.5%
	Italian	91.0	84.5	74.7	70.4	72.6	82.0%
% Routines	English	14.2	19.5	18.7	15.0	9.1	15.5%
	Italian	7.8	13.3	20.7	20.1	16.4	13.8%
% Functors	English	3.2	3.6	5.8	5.2	5.4	4.4%
	Italian	0.0	1.1	1.3	3.5	4.0	1.4%
% Predicates	English	2.2	1.5	4.8	7.0	11.6	4.6%
(Verb + Adj)	Italian	1.3	1.0	3.3	6.0	6.6	2.8%

Table 7: Normative composition of early productive vocabulary according to language and total vocabulary size (adapted from results reported by Caselli, et al., 1995).

A comparison of the composition of Leo's vocabulary (in Table 6) with the results obtained by Caselli et al. (1995) (in Table 7) reveal some interesting similarities and differences that may reflect on his overall rate of lexical acquisition. For the purpose of comparing the size of Leo's earliest vocabulary to those reported in Caselli et al (1995), non-language specific items were counted as doublets, belonging to each language: this gave Leo an English vocabulary of 26 words, and a Spanish vocabulary of 46 words.

If we compare Leo's vocabulary in each language, then, to the English and Italian-speaking infants whose vocabularies ranged from 21-50 words (marked in bold in Table 7), we see that in both English and Spanish he has a lower overall percentage of nominals, and a higher percentage of routine language. This is particularly striking in Spanish, where routines actually make up a full 46% of his total vocabulary, surpassing the amount of nominals.

As Caselli (1995) points out, "routines...form another category that decreases in relative size as vocabulary expands. Indeed, just as proper nouns and sound effects constitute the "starter set" within the nominal category, these routines can be viewed as a "starter set" in the category of non-nominals." (p. 177). That Leo, with a vocabulary of almost 50 words in Spanish at an age of 27.5 months (almost a full year older than the oldest children in Caselli's study), has continued to acquire routine language at a greater rate than common nouns may be considered the first of several signs that his lexical/semantic development is proceeding at a slower rate than that of his peers with similar levels of productive vocabulary.

Additionally, three of the items classified as predicates in Leo's Spanish vocabulary were imperative forms of lexical verbs (*mira, toma, vamos*) that may have been more appropriately classified as routines as well, due to the fact that they were observed only in this form, were over-generalized to apply to a number of different situations, often used as de-contextualized exclamations, and because of theoretical arguments such as that made by O'Grady (1987) that a child must have mastered a certain amount of nominal

arguments before being capable of predication. They were classified as predicates here, however, in order to conform to Caselli's criteria and viewed within the context of this robust database of cross-linguistic norms for lexical composition.

6.3 Word combinations

6.3.1 MLU-w

Leo's mean length of utterance (MLU) for each session was calculated automatically by the CLAN program. The MLU counts here are measured in words, as opposed to morphemes, following advice given by Gutiérrez-Clellen et al., (2000) indicating that MLU counts in words are better suited to Spanish-speaking and bilingual children. In fact, as noted by Jackson-Maldonado & Conboy, (2007) MLU-w is the widely accepted standard for all languages other than English (p. 144). In particular, for bilingual children this count usefully allows for the inclusion of mixed utterances, which are typical in the early stages of bilingual development. The MLU-w counts presented at various points below indicate the average the number of words per child utterance over the entire taped session.

** Leo's MLU from 24 to 27 months*

Up until the age of 27 months, the highest recorded MLU was 1.2 at time 5. This MLU may even be deceptively high, as certain of the frozen phrases described above counted as two words (e.g. *ya esta*) for the purposes of grammatical analysis, and because certain non-words such as babble, exclamations and sound effects were coded and analyzed as words (therefore an example like "*woah, cayó*" was considered a 2-word utterance for the calculation of MLU, whereas it is not considered as a relevant combination for the discussion at hand because the exclamation *woah* carries no syntactic information). Table 8 (below) gives Leo's MLU counts from 24-27.5 months.

Time	Age	MLU-w
5	2;00.00	1.213
6	2;00.12	1.023
7	2;02.27	1.196
8	2;03.11	1.158

Table 8: Leo's MLU-w from 21-27.5 months

*** MLU norms for English and Spanish-speaking toddlers**

Among the best normative data on the MLU of Spanish-speaking children comes from the 1979 study by Echeverría, who reported on 102 monolingual children acquiring Spanish in Chile. His results are presented below in Table 9, and the two age groups relevant for comparison with our subject are highlighted in gray.

Age	Mean MLU-w
1:6-2:0	2.51 (2.3-2.7)
2:1-2:6	2.99 (2.7-3.2)
2:7-3:0	3.44 (3.2-3.6)
3:1-3:6	3.88 (3.7-4.0)
3:7-4:0	4.33 (4.1-4.5)

Table 9: Spanish-speaking MLU norms
(from Echeverría's (1979) reports on 102 Spanish-speaking subjects)

Robust norms for English-speaking children (seen in Table 10) are found in the report by Bates, Dale & Thal (1995), which documents 1,803 children's early lexical development in English. Total group values are given as median values (to minimize the effect of the large SD discussed above in the section on variability in monolingual acquisition), and means are given for the children in the lowest ten percent.

Age (in months)	MLU (median)	MLU lowest 10%
21	1.5	1.2
22	1.8	1.2
23	1.9	1.2
24	1.8	1.2
25	2.2	1.4
26	2.3	1.2
27	2.6	1.4

Table 10: English-speaking MLU norms
(from Bates, Dale & Thal (1995) reports on 1,803 English-speaking toddlers)

****Comparison to monolingual norms***

As discussed above, one must exercise caution when comparing bilingual children with monolingual peers (and better assessment of Leo's progress will be made after comparing his early production to that of bilingual peers); that said, there are limited MLU norms for bilingual children in this age range, and so the best available norms still come from monolingual peers. A quick glance at the expected MLU values for Spanish and English-speaking monolingual toddlers (in tables 9 and 10, respectively) provides us with more evidence that Leo's lexical development and word combinations are progressing more slowly than might be expected for his age: at age 2, Leo's MLU of 1,213 is well below the range for 2 year-old Spanish-speakers, and in line with the lowest 10% of two year-old English-speakers. We will take these shortcomings and further impetus to continue our examination of Leo's lexical acquisition for signs of language delay.

6.3.2 Longest Utterances:

Up until 27.5 months the longest utterances recorded for Leo included two fully formed phrases at age 2: "*se cayó el agua*", and the mixed utterance "*yo quiero more*", as well as a handful of utterances combining words with onomatopoeia and other sound effects: (e.g. "*se cayó y boom!*"), and the single coordinated phrase "*papa y mama*". Although the first two utterances were captured on tape, and the mother claimed that this type of phrase was a typical occurrence at that point in development, both occurred at t5 (when the child was 2) and no similarly well-formed combinations were observed at t6 or t7, when the child was 24.5 and 27 months respectively, although from t8 (age 27.5 months) onward such meaningful word combinations became more frequent.

6.4 Vocabulary Size: Comparison to bilingual norms

*** Pearson, Fernandez & Oller (1993)**

Pearson, Fernandez & Oller (1993) studied 25 simultaneous Spanish-English bilinguals ranging from 8-30 months in age, and compared their rates of acquisition with those of 35 age-matched monolinguals. The averages for vocabulary size for both groups at the different ages observed are presented below in Table 11. Although the standard deviation for each group is extremely high, these numbers provide a first basis of comparison for case study Spanish-English individuals and will be discussed below in the context of Leo's lexical development.

Ages	Bilingual Mean (SD)	Monolingual Mean (SD)
16-17 months	42 (32)	44 (35)
18-19 months	82 (66)	113 (103)
20-21 months	186 (135)	109 ((71)
22-23 months	168 (151)	155 (114)
24-25 months	224 (169)	286 (170)
26-27 months	414 (264)	406 (172)

Table 11: Results from Pearson, Fernandez & Oller (1993) showing average productive vocabulary size according to age for Spanish-English bilingual and monolingual toddlers.

*** Patterson (1998)**

Further normative data comes from the 102 Spanish-English bilinguals (aged 21 to 27 months) observed in Patterson (1998). The results reported for the average vocabulary size by age are reproduced below in Table 12 (copied from Patterson, 1998: p. 50):

QuickTime™ and a
TIFF (Uncompressed) decompressor
are needed to see this picture.

Table 12: Results from Patterson (1998) describing the productive vocabulary size of 102 bilingual Spanish-English toddlers.

A comparison of results from the two studies (taking into account the large amount of variability seen in both) reveals comparable vocabulary sizes for the bilingual groups across the age ranges, to the extent that the means from Patterson fall within the range (SD) reported in Pearson, and vice versa. These data combined provide us with a metric for evaluating Leo's acquisition of productive vocabulary in comparison with a robust group of age-matched and language-matched bilingual peers.

Leo's vocabulary from 21-27 months (completely described above) is summarized in a comparable format in Table 13:

Age (in months)	# Words Produced
21-22	8
23-25	45
26-27	57
27.5	64

Table 13: Leo's Productive Vocabulary Size (in words) from 21-27.5 months

As we can see, the size of Leo’s productive vocabulary falls well below the comparable means for bilingual subjects in both Pearson et al (1993) and Patterson (1998); and he is close to the lowest end of the range at all three age ranges reported in Patterson. Indeed, he falls below the minimum for 90% of the children in Patterson’s study for two out of the three age ranges, and remained below the minimum for the 26-27 month range at data collection time 8, at the age of 27.5 months. Table 14 helps illustrate the extent of his expressive vocabulary delay clear, providing a direct comparison of Leo’s vocabulary size at 21, 25, and 27 months, with the mean vocabulary sizes reported for the bilingual subjects in Pearson et al. (1993) and Patterson (1998)

Age (months)	Leo	Pearson (1993)	Patterson (1998)
21	8	186	101
25	45	224	128
27	57	414	208

Table 14: Leo in comparison to bilingual peers⁶

⁶ The vocabulary sizes shown for Pearson et al (1993) and Patterson (1998) are the *mean* scores for their 25 and 102 respective subjects.

7. Delayed expressive vocabulary

Looking at Leo's early expressive vocabulary we can see that, at 24 months he has what has been described as expressive language delay. His total vocabulary of 32 words at this age places him below 85-95% of monolingual English speakers (Patterson, 1998), and 90% of monolingual Spanish-speakers (Jackson-Maldonado et al., 1993), and well below the recorded means for the bilingual age- and language-matched peers reported above (Pearson *et al.*, 1993; Patterson, 1998)⁷.

The follow-up question is what, if anything, Leo's expressive language delay *means*—with regards to his overall linguistic development—and whether it has ramifications for his future abilities. Essentially, the next step in this study aims to investigate whether Leo at 24-27 months has the relatively “normal” delay that one frequently observes in “late-talkers”, or whether this early expressive delay is a first sign that a language disorder is present. A handful of studies have investigated the links between delayed expressive vocabulary and later language delay; these will be briefly reviewed below in the interest of applying relevant findings to the case of our subject. (While the studies that have investigated the links between delayed expressive vocabulary and later language delay have in some respect been inconsistent, across the board they recommend that late talkers receive consistent monitoring (Paul 1996), so that early intervention can take place if necessary.)

7.1 Late bloomer or language impaired?

A major research question in recent years has focused on how and how early we can identify those late talking toddlers who will “stay late” (Thal et al., 1997, p. 248) as opposed to those who will catch up to their peers. Specifically, researchers such as Rescorla (1997), Thal et al., (1997) and Paul (2001) have investigated the links between vocabulary delay in 2-year old toddlers and later diagnosis of language impairment.

⁷ See Table 14

Rescorla (1997) studied 34 toddlers who were classified as having expressive language delay between the ages of 24 and 31 months. In the background to her study, however, she first reviewed the findings from 5 different large-scale studies of late-talking toddlers, and found that these data as a whole indicated that “toddlers who are slow to talk are at risk for continuing expressive language delay at age 3” (pp 558)

Research on late talkers has shown that these children are no less heterogeneous than their “normally” progressing peers. Rescorla (1997) provides a review of studies assessing late talkers at various points in early development and reports large inconsistencies and variability in predicting persistent delay from early expressive vocabulary delay. In her own (1997) study, however—in which late talkers are identified as children who, at age 24 months, have expressive vocabularies of less than 50 words and have not yet begun to combine words—she indicates that late talking toddlers are at special risks for continued delay when their delays persist past 24 months. That is, the older the child identified with delay, the less likely that he or she is simply a “late bloomer” and the more likely that some type of language impairment is present (Rescorla, 1997, p. 564).

Patterson (1998), as well, suggests greater concern for older children identified as delayed: she recommends follow-up screening for children who, like Leo, fall within the lowest 10% in terms of productive vocabulary size, and she specifically recommends follow-up monitoring for those children who are delayed at the later age-ranges; that is, children who are significantly below the average at 26-27 months of age.

Since Leo has been identified at 27.5 months as having expressive language delay in comparison to his bilingual peers, he fits the profile described in Patterson (1998) as a toddler who is at risk for a language disorder. The following section will attempt to provide a general analysis of his current language abilities, focusing on those areas that have been identified as problematic for SLI children in English and in Spanish, and an attempt will be made to determine whether Leo may be language impaired, or is simply a

“late bloomer”, perhaps as a result of bilingualism, who will eventually “catch up” to his peers.

7.2 Parental Concern

As was mentioned in the theoretical background, because of the scarcity of norms available to assess the age-appropriate progress of bilingual children, those studies that have investigated language impairment in bilingual children have tended to rely on parental concern as a first point of reference in identifying potentially impaired subjects; indeed, clinical assessment of bilingual subjects often begins only after this concern is expressed. While Leo’s age and sociolinguistic circumstances led the researcher to resist labeling the child as language impaired for some time, (the two previous studies referenced in chapter 5 avoided addressing this hypothesis despite signs of delay), the early data shows that he consistently evidenced a linguistic repertoire at the lowest end of comparable developmental expectations.

In one of the most recent data collection sessions undertaken for the present study, as the child was approaching his fourth birthday, the father finally directly expressed his concern to the researcher that Leo’s linguistic abilities were below average. He intimated that Leo was frequently unintelligible, and that although his parents were generally able to understand him due to both practice and high motivation, he appeared to be having difficulty making friends at school due to his inability to communicate with the other children; according to his father, his teachers had also mentioned their difficulty understanding Leo’s speech at times. The concern expressed by his father opened the door for a detailed investigation of the child’s speech, in which we attempt to assess whether our “late talking” subject is merely a “late bloomer” due to the complexity of his multilingual linguistic environment, or whether he appears to be at risk for protracted delays and disabilities in his language development.

8. Phase II: Language abilities at age 4

As discussed above, evaluating a bilingual child's dominant language is an essential first step before assessing their abilities in each language. It was clear at 27.5 months that Spanish was emerging as Leo's dominant language, and that the contexts of input were likely to support this trajectory. A look at data from the 6 sessions closest to Leo's fourth birthday (ages 3;08-4) help us confirm that Spanish has indeed become Leo's dominant language, which can be seen through his MLU in different contexts, through language specific type/token data across sessions, and through the discourse patterns observed in English-speaking contexts, in which he frequently resorts to Spanish and is unable to maintain a monolingual English conversation. We will use these measures and phenomena to evaluate Leo's language dominance and get a general impression of his language abilities at age 4 before moving on to examine his speech in each language for evidence of SLI in section 9.

8.1 MLU-w

Table 15, below, gives us information on Leo's MLU from 42-48 months in 3 different contexts: in an overwhelmingly bilingual context with his mother; in a monolingual Spanish context with his father; and in a primarily monolingual English context with the researcher (using the theory from Juan-Garau & Perez-Vidal (2001) among others, that the adult interlocutor establishes the communicative context as either a mono- or bilingual one when interacting with a bilingual child.)

We can see that his average MLU in the month leading up to his 4th birthday is 2.9 words per utterance, and that the highest recorded MLU was in data collection time 26, in a monolingual context of interaction with his Spanish-speaking father (see table 15, on the following page).

Time	Age	MLU	Adult Interlocutor
22	3;08.02	1.915	Mother
24	3;10.11	2.853	Researcher
25	3;10.25	2.512	Researcher
26	3;10.27	3.351	Father
27	3;11.17	2.683	Researcher
28	4;00.00	3.040	Researcher
Average = 2.897			

Table 15: MLU counts from t22-t28 and average from t25-28

8.2 Language use according to linguistic context

Table 16 shows the amount of each language used in the different contexts reported above, based on the number of word types in each language divided by the total number of word types used in the session.

Time	Age	%English	%Spanish
22	3;08.02	47,69	35,38
24	3;10.11	25,61	60,35
25	3;10.25	20,90	66,04
26	3;10.27	0,46	92,17
27	3;11.17	20,16	67,59
28	4;00.00	23,32	67,36

Table 16: Percent of word types used in each language

As we can see, Spanish is used more than 60 percent of the time in all contexts except for t22, in which the child is interacting with his mother in a bilingual Spanish/English context. A review of the transcript of t22 indicates that the type counts do not, in this case, seem to reflect a higher amount of English used *spontaneously*, but rather a high amount of direct repetition of adult speech, particularly in the direct response to questions, as in the example below:

t22:

- (a) ***MOT:** should we do a bath tonight, or just wait?
***CHI:** wait.

In the analysis of this piece of our corpus, no attempt was made to control for child imitation when calculating the types and tokens of English and Spanish recorded across contexts; due to the difficulty of reliably distinguishing pure imitation from valid responses (such as that seen in example (a) above).⁸ If we look at the numbers of English types and tokens used in the 18 mother/child sessions as a whole, it is clear that Spanish predominates in all contexts, regardless of adult interlocutor, thus confirming our suspicion that Spanish is the stronger language with regards to lexical abilities.

8.3 Longest Utterances

Another indicator of language dominance comes from reviewing the child's longest utterances in the English-speaking contexts above. If we review a list of the child's 5 longest utterances for the six data collection sessions from Table 15, they paint a clear picture of Leo's significantly stronger abilities in Spanish. Almost all of Leo's longest utterances are entirely in Spanish, regardless of the language context, and the few that contain English tend to imbed a single English word into a Spanish phrase, as seen below in examples (b) and (c):

t22:

- (b) ***CHI:** y esta es una xx para enganchar el works.⁹

t28:

- (c) ***CHI:** ...pues va abajo en el agua # y hay sharks .
***CHI:** mira... el fish se lleva el nene!

⁸ Imitated words were, indeed, identified and eliminated from the calculations of vocabulary size and composition undertaken in phase I of our analysis, however for the overall focus of phase II (on grammatical abilities) it was not deemed essential.

⁹ xx indicates an unintelligible word; see the following section on disfluency, and appendix 1 which provides an overview of CHAT conventions for further details.

example (d), in which the mother simply ignores the child's code-switching and continues discourse in English; and the "expressed guess strategy", in which the mother translates the child's Spanish statement and prompts a yes/no response (seen in examples (e) and (f) below, the first with code-switching, the second without) (see Lanza (1992) and Juan-Garau & Perez-Vidal (2001) for detailed treatments of each of these strategies):

t22:

- (d) *MOT: we have to cut your hair Mamo.
*CHI: porque?
*MOT: (be)cause it's long.
- (e) *CHI: quiero agua.
*MOT: you want some agua?
*CHI: yeah.
- (f) *CHI: quiero xxx book.
*MOT: you want to look at the book?
*CHI: si, todos juntos.
*MOT: all together?
*CHI: yeah

While the "move strategy" is described in Juan-Garau & Perez-Vidal (2001) as being among the least likely to promote production in the weak language, especially when combined with adult code-switching, the "expressed guess" strategy seen in examples (b) and (c) is supposedly one of the best strategies in this respect, as it provides the child with the necessary input to cover any lexical gaps, but indicates that the appropriate language of discourse is the adult alternative. However, although this strategy is technically categorized towards the monolingual end of the spectrum in Lanza's (1992) model (see Figure 1), the data from Leo indicate that this strategy may have the counter-productive side-effect of causing him to rely excessively on one-word answers. This reliance might prevent the acquisition of new vocabulary in the weak language, as he realizes it is unnecessary to make the effort to acquire the word when it is continually supplied by his mother; this is a particular danger since he has only one interlocutor (his mother) who regularly provides input in the weak language, and even more so because she consistently ignores discourse errors and infelicities in his speech.

Additionally, there is some evidence that Leo has begun responding affirmatively to yes-no questions even when comprehension is unclear, as a strategy to extract more information from his mother. This can be seen below in example (g) where the strategy fails and he has to actively ask for more information, returning to Spanish and asking *porque?* (*why?*), even though an agreement appears to have been reached between the two, making the question pragmatically awkward:

t22:

- (g) *CHI: y esta es una xx para enganchar el works.
 *MOT: there's a rope for tying up the work?
 *CHI: si, asi va [^ makes pulling movements].
 *MOT: and to pull it up on the high buildings?
 *CHI: yeah.
 *MOT: yeah?
 *MOT: that's right.
 *CHI: porque?

The use of the *yeah* response as an evasion strategy can be seen more clearly in an interaction between the mother, researcher and child, in which the child answers *yeah* even though he has clearly misunderstood the reference, which becomes clear once his mother intervenes with a code-switch to save the conversation from dissolving:

t22:

- (h) (the child has finished mentioning the name Nuria)
 *RES: who's Nuria?
 *RES: someone from school?
 *CHI: yeah.
 *RES: yeah?
 *RES: your teacher?
 *CHI: yeah.
 *CHI: ## otro esta mojado el t-shirt [pronounced "teesher"].
 *MOT: no not the t-shirt (laughing) .
 *CHI: the t-shirt [teesher] !
 *MOT: yeah the other teacher is wet, but she asked if Nuria was the teacher.
 *MOT: like the maestra ## the teacher.
 *CHI: la maestra.
 *MOT: yeah, like Nuria and Mica are the teachers.

A final example of the use of *yeah* in spite of an apparent lack of comprehension can be seen in an interaction between the researcher and child in t24, in a session where the two are playing alone and looking at picture books. The researcher, whose preferred strategies are the “minimal grasp” and “expressed guess” strategies that aim to put pressure on the child to maintain discourse in the target language, was also observed to frequently ask direct questions to the child and ask for more explanations after one word responses, as in example (i):

t24:

- (i) *RES: how (a)bout this? (pointing to picture of a chimney)
- *CHI: que esto que sale smoke.
- *RES: this is where smoke comes out.
- *RES: do you know what it's called?
- *CHI: yeah.
- *RES: what?
- *CHI: no se.
- *RES: no?
- *RES: it's called a chimney.
- *CHI: oh.

The child has clearly learned that responding with *yeah* will usually result in more information from the adult, however when the researcher questions him he changes his tactic and admits that he doesn't know (*no se*).

Overall, Leo's tendency to use Spanish even when his adult interlocutors are, to varying degrees, insisting on English as the language of discourse, illustrates his far greater level of comfort and lexical abilities in Spanish, his dominant language.

9. Evidence of SLI at age 4

Our overall assessment of the MLU data, longest utterances, and code-switching patterns presented in the previous section allow us to state with some confidence that Spanish is Leo's dominant language. We will now move on to look at the potential signs of SLI in each of his two languages, then, however greater relevance will be granted to any evidence found in Spanish, as this is more likely to indicate true language difficulties, as opposed to incomplete acquisition due to insufficient or inconsistent input.

To assess Leo's recent speech samples for evidence of SLI, it was necessary to choose clinical measures that have been identified as accurate for English and Spanish-speaking bi- and monolingual children. In English, as was discussed above in the theoretical section, children with SLI appear to have the most difficulty with verb acquisition; the acquisition of verbs by English-speakers with SLI has been described as "delay within delay" (e.g. Simon-Cereijido & Gutiérrez-Clellen, 2007). In accordance with this, the most accurate discriminator available for English-speakers with SLI is a composite of finite verb morphology; this measure, taken in tandem with MLU, was found by Bedore & Leonard (1998) to accurately identify 95% of the SLI children and 95% of the typically developing children in their study; other studies have combined this verb morphology composite with other measures of ungrammaticality to further obtain an overall proportion of ungrammatical utterances (see Simon-Cereijido & Gutiérrez-Clellen, 2007 for a review).

In Spanish, it has been found that verbal morphology is not a good clinical indicator, as verb use in SSLI children does not reach the typical error rates reported for English-speaking children (Restrepo & Gutiérrez-Clellen, 2001). In contrast, evidence of SLI in Spanish-speaking children is seen in article use (omissions and gender substitutions of articles in noun phrases), and freestanding morphemes such as clitic pronouns (Bedore & Leonard, 2001); however it has also been found that the type of language task, or data collection, can affect the operationalization of these elements as clinical markers of SLI.

With clitics, particularly, since in many cases their use is not obligatory, it may be difficult to get an accurate feeling of children's abilities, unless controlled tasks are administered. Gutiérrez-Clellen et al., (2000) found that clitic accuracy was above 96% for both SLI and normally developing controls in spontaneous language tasks, whereas it was 37% for SLI and 80% for controls in structured tasks. Given the nature of our data, then, of spontaneous language samples, we must look for a combination of clinical markers that might be expected to assess Leo's Spanish for language impairment.

The measures chosen for Spanish analysis were adopted from research by Simon-Cerejido & Gutiérrez-Clellen (2007) on Spanish-speaking children in the United States with varying degrees of exposure to English (some were identified as bilingual, although bilingualism was not the focus of this study on SSLI). The study tested a number of different possible discriminators of SSLI, including MLU-w, an ungrammaticality index (UNGRAMM), the percentage of accurate use of theme arguments, and the proportional use of ditransitive verbs. Overall, the only variable that appeared to have good discriminate accuracy on its own was UNGRAMM: a measure based on the percentage of utterances with grammatical errors in obligatory contexts found in the sample as a whole. It was found that the combined measure of UNGRAMM+ MLU-w had the best sensitivity and specificity (79% and 100% respectively) in discriminating between groups in their exploratory study of 38 children (19 LI and 19 typically developing). Because their data and subject profiles are well matched to those of our study (spontaneous language measures; semi-bilingual Spanish-speaking toddlers from low socio-economic backgrounds), these two variables will be adopted to analyze Leo's Spanish abilities in section 10.2. First we will briefly look at the evidence for SLI in his weaker language.

9.1 Evidence in English

Unfortunately for this study with regards to identifying SLI across a bilingual's two languages, the best clinical marker available for identifying SLI in English, verbal morphology, is largely unavailable for study at this point, due to Leo's weakness in this area. That is, Leo's verb use in English is extremely limited, and reliable examination of

his abilities with regards to SLI must be reserved for future study, although the relative absence of verbs may, in itself, serve as evidence that he has trouble in this area, which would be expected if SLI is indeed present.

Looking at the five of the most recent data collection sessions in which some English is used: t22, t24, t25, t27 and t28 (recorded when Leo was aged 3;08-4;00¹⁰), we see only 9 different English verbs. The majority of these verbs (6 of the 9) are used only in the gerund form and either without any auxiliary verb, or embedded in Spanish syntax and supported by a Spanish auxiliary. For example, he uses the gerund *working* twice, once in t22 (example a) and once in t25 (example b). In the former he uses it with an English singular subject but without the obligatory auxiliary verb *is*:

t22:

(a) *CHI: daddy working.

And then in t25 he incorporates the English gerund into a Spanish grammatical context, with an implicit subject and the 3rd person singular auxiliary *esta*:

t25:

(b) *CHI: esta working.

This second pattern is repeated in t28 with the gerund form *fishing*:

t28:

(c) *CHI: mira, esta fishing.

The remaining gerund types: *raining*, *running*, *brushing teeth* and *sleeping*, are all used as isolated single word explanations without any supporting syntax to provide further information, as can be seen in example (d) on the following page:

¹⁰ Please refer back to Table 15 for exact ages at each of these times

t28:

- (d) ***RES:** what's happening? (pointing to a picture book)
- ***CHI:** raining.
- ***RES:** here it's raining.
- ***CHI:** yeah.

The only three verbs that occur in non-gerund forms show a similar lack of supporting syntax, or are embedded in Spanish syntax. For example he uses the verb *count*, several times in t22, as an isolated imperative (e), as an imperative embedded in Spanish structure used alone (f), and as an infinitive following the Spanish modal verb *poder* (g):

t22:

- (e) ***CHI:** count!
- (f) ***CHI:** ahora tu count.
- (g) ***CHI:** no puede count!

The exact pattern seen in (g) is seen again in (h) with the verb *play* in t24:

t24:

- (h) ***CHI:** grandma no... no puede play mucho.

Finally, we have two instances of the copula *is* used as a clitic attached to the pronoun *it*; the first incorrectly omitting the indefinite article:

t24:

- (i) ***RES:** what's this [= pointing to necklace child has picked up and put on]?
- ***CHI:** it's... necklace

t25:

- (j) ***CHI:** it's big!

The verb *to be* in English never occurs alone or in any other forms, however, and therefore it is reasonable to make the hypothesis that, for the child, the word *it's* may be represented as a single word roughly equivalent to *es* in Spanish, as opposed to two

morphemes including a subject and verb. In contrast, Leo uses the verbs *ser* and *estar* (the Spanish equivalents of *to be* in a number of different forms at this point in development).

As was discussed above, difficulty with the acquisition and use of verbs is an indicator of language impairment in English-speaking bi- and monolingual children. In this case, however, due to the fact that Leo is highly dominant in Spanish and evidence indicates that he may be developing into a passive bilingual, it is difficult to figure out whether his limited abilities with verbs are due to a lack of English abilities in general, or are due to the presence of SLI. To better gauge the likelihood that Leo indeed has some sort of language disorder, we must look at the evidence available for his dominant language, Spanish.

9.2 Evidence in Spanish

To reliably assess Leo's abilities in Spanish, his dominant language, data collection session t26 (recorded a month before Leo's fourth birthday) was analyzed and coded using the measure UNGRAMM described above, adopted from Simon-Cereijido & Gutiérrez-Clellen, 2007.

Because in t26 Leo was playing alone with his monolingual father in a purely Spanish context, this was the only session that showed an almost complete absence of mixed utterances and could be thoroughly assessed for grammatical accuracy in Spanish (as seen above in Table 16, the child produced Spanish *at least* 97% of the time in this context; the few items that were not explicitly marked as Spanish were mostly non-language specific items such as interjections and onomatopoeia; indeed, only one English word appeared in the entire sample, and one could make the argument that the word, *cookie*, should be given NLS status, as it appears in marketing and packaging contexts in Spain, and as the monolingual father clearly understands and responds to the term).

To calculate UNGRAMM, the transcript from t26 was analyzed and marked for all ungrammatical errors in obligatory contexts, including errors with articles, verbs, clitics, prepositions, adjectives, nouns, and conjunctions, following the guidelines established by Simon-Cerejido & Gutiérrez-Clellen (2007): article errors were omissions and substitutions of gender and number; verb errors were omissions, substitutions of person, number and tense, and overgeneralizations. One-word, unintelligible, and mixed utterances were excluded from the analysis, and the MLU-w was recalculated excluding these utterances, to fully replicate the methods of Simon-Cerejido & Gutiérrez-Clellen (2007), and ensure that MLU-w+UNGRAMM would be a reliable discriminator.

After excluding all one-word and unintelligible utterances (including utterances with more than one element marked as xx or xxx, or utterances with an xx or xxx in an area that made it difficult to establish grammaticality) we were left with a sample of 169 utterances (825 words). His MLU-w for the sample is 4.107, considerable higher than the original count, reflecting the high proportion of one-word utterances. A total of 79 ungrammatical errors were identified, giving him an UNGRAMM score of 0,46.

If we look at the data for the 38 children in Simon-Cerejido & Gutiérrez-Clellen (2007) in comparison to that obtained from Leo (Table 17), we can see that Leo clearly resembles the LI group more than the typically developing (TD) group with regards to both of the clinical measures under study:

Measure	TD group Mean / SD	LI group Mean / SD	Leo
MLU-w	5.68 / 1.01	4.44 / 1.54	4.12
UNGRAMM	0.17 / 0.04	0.35 / 0.11	0.46

Table 17: Comparison of Leo's UNGRAMM & MLU-w with results from Spanish-speaking toddlers in Simon-Cerejido & Gutiérrez-Clellen (2007)

Furthermore, we can see that Leo falls at the highest end of the range for the LI group with regards to his UNGRAMM score, leaving little room for doubt that, even considering the large amount of unintelligible and one-word material that was removed

(the issue of intelligibility will be addressed in the following section), Leo shows clear signs of SLI in his dominant language. A breakdown of the grammatical errors by error type is given below in Table 18:

Type of Error	Frequency
Verb errors	43
Omitted	9
Overregularizations	2
Incorrect form	32
Clitic errors	12
Omitted	10
Gender agreement	2
Article errors	6
Omitted	1
Agreement	5
Preposition errors	8
Omitted	7
Incorrect form	1
Demonstratives	5
Other errors	5
Pronoun form	1
Adjective agreement	1
Word Order	2
Unclear	1

Table 18: Grammatical errors by type

Interestingly, the most common error type observed was for verb forms, primarily involving incorrect conjugation with regards to person, number, and tense, and omissions of verbs altogether. This contradicts our expectations based on studies of SSLI children, who appeared to have a good grasp of verbal morphology and pronounced difficulties with the noun phrase. If this pattern of ungrammaticality can be observed over more sessions, it might have interesting implications for the study of SLI in Spanish-English bilinguals, particularly in those who consistently receive mixed input.

This phenomena will be left up to future study, however, as it remains possible that the relative infrequency of errors on clitics and articles in comparison to verb errors is simply the result of our data type: spontaneous language samples. As was mentioned above, it appears that SSLI children's errors become much more evident in structured tasks of elicitation, as spontaneous language may not reflect their propensity to (1) use simplified structures in which clitics are not obligatory; or (2) substitute clitic pronouns with nouns which, while infelicitous, is not registered by measures of ungrammaticality. One of the errors recorded as a word order error (example a) demonstrates this type of evasion strategy:

t26:

(a) *CHI: tu pone* en mi tractor este*. (referring to a block)

If we repair the errors in verb form and word order, we are left with the grammatical sentence: “*tu pon este en mi tractor*”, however it is likely that a more felicitous sentence would have replaced *este* with the clitic pronoun *lo*, resulting in the phrase “*ponlo en mi tractor*”, especially as the referent is clear to both speakers (father and son are looking at the same block).

Overall, Leo's Spanish shows clear signs of SLI, however controlled studies of clitic, verb, and article use will be needed to evaluate the extent to which he resembles other SSLI bi- and monolingual children with regards to how the disorder is manifested syntactically. Furthermore, a caveat with regards to all analysis of Leo's SLI is the high proportion of disfluent breaks in discourse and unintelligible material, which will be addressed below in the final section of this study.

10. Disfluency

Throughout this study it was informally observed that Leo's speech was difficult to comprehend due to phonological difficulties, hesitations and other disfluencies. At data collection time 26, the first suspicions of SLI made it necessary to formally address the issue of disfluency in Leo's speech, as it was thought that disfluency might be the true cause of perceived language difficulties and parental concern; that is, that a fluency disorder such as stuttering might be masking his linguistic abilities, thus giving a false impression of impairment.

The following section of this study analyzes disfluency in Leo's speech from t26-t28, observing the types of fluency errors that predominate ("normal" disfluencies vs. "stuttering-like" disfluencies), and the proportion of disfluencies in his speech according to language context. A comparison to normative data assesses Leo's fluency overall, and some discussion is made of how disfluencies might be interacting with his impaired language abilities and with the *perception* of these abilities.

10.1 Stuttering vs. "normal" disfluency

While all children are expected to be "disfluent" to some extent as they begin acquiring their native language(s), research on childhood disfluency has typically focused on the dichotomy between "normal disfluency" and "stuttering" (e.g. Bernstein Ratner, 2004; Ambrose & Yairi, 1999; Pellowski & Conture, 2002).

Normal disfluencies, which include phenomena like filled pauses and fillers, are seen as an integral part of spontaneous speech in both children and adults, or, in certain cases, as originating from limited language proficiency (e.g. Van Borsel et al 2001); stuttering, on the other hand is a speech disorder that impedes communication, and a condition that should be identified in childhood and treated by a speech therapist in order to avoid negative psychological consequences.

To distinguish between “stutterers” and those who are merely “normally disfluent”, researchers have formulated systems to categorize the specific types of fluency errors that the two groups manifest in different degrees. While certain types of filled pauses, hedges, repetition and incomplete thoughts are seen as normal disfluencies (ones that affect most speakers to some degree or another), stutterers generally produce a high proportion of repetition of single and multi-syllable words and parts of words, as well as disfluent pauses that lead to broken words and “blocks” before the onset of words (Ambrose & Yairi, 1999). Once disfluency errors have been classified, the most frequent tactic of assessment has been to collect spontaneous speech samples and measure the average frequency of disfluency per 100 words (i.e. Wexler & Mysak, 1982; Pellowski & Conture 2002), or per 100 syllables (i.e. Ambrose & Yairi, 1999; Carlo & Watson, 2003). The frequency of overall disfluency and stuttering-like disfluency provides the basis for diagnosis and an overall fluency score.

In many ways similarly to SLI, researchers have focused on ways to identify stutterers from the beginning of development, so that early intervention can take place. While it has been found that stuttering tends to appear between 2;06 and 3;06 years of age (Yairi & Ambrose, 1992), with the onset of word combinations and more complex syntax, it has also been found that many of the children who stutter early on in development manage to recover on their own (up to 80%) (Bernstein Ratner, 2004), and so additional research attention has focused on identifying factors that differentiate between stutterers who are likely to recover and those who are not.

Specifically relevant to our study, it has been found that: “children with less than average linguistic ability appear to be less likely to recover spontaneously from stuttering” (Bernstein Ratner, 2004, p. 295). Since Leo appears to fall into this category, it becomes all the more important that we identify whether or not his disfluency can be considered stuttering, as he may be less likely to recover without direct intervention.

Furthermore, if we find that Leo can, indeed, be classified as a stutterer, this will affect our assessment of his speech for SLI, as certain aspects of his observed language

difficulties may be due to phonological and motor deficits as opposed to cognitive or linguistic ones—as Leonard reminds us, “SLI... is a diagnosis based as much on exclusion as on inclusion” (1997, p. 10).

Although the bulk of research on childhood disfluency and stuttering has been carried out on English-speaking children, experiments with Spanish-speaking children, such as that by Carlo and Watson (2003) have found that similar methods and measures discriminate between Spanish-speaking stutterers and their normally fluent peers. Although certain differences have been found between the common stuttering patterns in English and Spanish (Carias & Ingram, 2006), overall the same *methods* of fluency analysis may be employed across the two groups and with Spanish-English bilingual toddlers like Leo.

10.2 Disfluency in Leo’s speech: t26-t28

As mentioned above, Leo’s speech from the final three data collection sessions (t26-t28)—one a monolingual Spanish context in which Leo interacts with his monolingual father, and the other two bilingual, English predominant contexts, in which Leo interacts with the English-speaking researcher—was analyzed with regards to fluency to determine whether he could be classified as a stutterer, or whether his observed disfluency was the normal result of limited language proficiency, and perhaps linked to the language difficulties caused by SLI.

The method of fluency assessment was modeled after those used by Pellowski & Conture (2002) and Ambrose & Yairi (1999); transcripts were coded for fluency errors divided into two categories, following those identified in Ambrose & Yairi (1999), and can be seen in Table 19 on the following page (additional information regarding the classification and assessment of disfluency is provided in Appendix II):

Type of Disfluency	Example
Stuttering-like disfluencies (SLD)	
part-word repetition (PWR):	“b-but”; “thi-thi-this”
single-syllable word repetition (SWR)	“yo yo yo”; “and and”
disrhythmic phonation (DP)	prolongations: “mmy”; “coookie” blocks: “#toy” broken words: “o#pen”
Other disfluencies (OD)	
interjection	“um”; “eh”
revision/abandoned utterances	“Mom ate/Mom fixed dinner” “I want/Hey look at that”
multisyllable/phrase repetition	“because because”; “I want I want to go”

Table 19: Disfluency types and examples

Leo’s total “stuttering-like” and “other” disfluencies were calculated for each transcript, the results of which are presented in Table 20.¹¹

Error type:	PWR	SWR	DP	ITJ	RV/A	M/PR	Total SLD	Total OD
t26	6	16	4	18	46	19	26	83
t27	2	13	2	10	44	15	17	69
t28	1	3	6	9	19	1	10	29

Table 20: Disfluencies by type per session t26-t28

The proportion of disfluency in Leo’s speech was then calculated per 100 words by dividing the total SLD and OD counts into the number of words in the sample (see table 21, below). Following Pellowski & Conture (2002) and Ambrose & Yairi (1999), the sample eliminated all one-word positive or negative responses such as “si”, “no”, “yeah”, “ok”, as it has been found that such responses rarely present disfluencies and that their

¹¹ Please refer back to table 19 for the full explanations of these acronyms; these data are presented for comparison within, as opposed to across sessions, as the sessions contain different number of child utterances, and the errors are presented here as total *numbers*, as opposed to percentages. Percentage data for comparison between sessions is provided in table 21.

high frequency in child speech may affect the discriminatory abilities of the SLD and OD measures.

Disfluencies per 100 words:	Total disfluencies	SLD	OD
t26	10,62	2,53	8,09
t27	7,87	1,56	6,31
t28	6,03	1,55	4,48

Table 21: Disfluencies per 100 words for sessions t26-28

Finally, Leo’s overall disfluency score was calculated using a weighted measure developed by Ambrose & Yairi (1999) which was found to be the most accurate measure in their study for discriminating between stutterers and non-stutterers. This calculation takes the sum of PWR and SWR errors per 100 words (pw + ss), multiplies this figure by the mean number of repetition units of each word or part-word (ru), and then adds the weighted frequency of DP per 100 words (2 x dp); the resulting equation is given in example (a). The weighting of DP errors is justified by Ambrose & Yairi because: “not only are these infrequent in early stuttering and rare in normally fluent children...but they have traditionally been considered an advanced symptom” (p. 3).

$$(a) \text{ Weighted SLD Measure} = [(pw + ss) \times ru] + (2 \times DP)$$

Overall, Leo obtained the following weighted SLD scores across sessions:

Weighted SLD Score	
t26	3,61
t27	2,01
t28	2,94

Table 22: Leo weighted SLD scores

This data is best viewed in the context of the other two studies that analyzed disfluency with the same measures. Ambrose & Yairi (1999) reported data from 90 English-speaking children who were classified as stutterers, and a control group of 54 normally fluent English-speaking children, from the ages of 2-5 years old. For the 33 stutterers and

24 non-stutterers who fell into the age group comparable to our subject (3;0-3;11) the disfluency data per 100 syllables is given in Table 23:

Non-Stuttering Group	
Stuttering Disfluencies	Other Disfluencies
1.60 (0.92)	4.58 (2.13)
Stuttering Group	
11.75 (7.26)	5.67 (2.70)

Table 23: SLD and OD amounts from Ambrose & Yairi (1999)

Pellowski & Conture (2002) studied 72 English-speaking children from 3-4 years old, 36 classified as stutterers, and 36 classified as non-stutterers, and obtained the data seen in Table 24 below. The table shows the group means and the standard deviations are given in parentheses:

Non-Stuttering Group			
Total Disfluencies	Stuttering Disfluencies	Other Disfluencies	Weighted SLD
2.6 (1.8)	1.1 (0.8)	1.5 (1.6)	1.2 (1.0 SD)
Stuttering Group			
10.1 (5.0)	8.6 (5.3)	1.5 (1.9)	20.5 (18.5)

Table 24: Data from Pellowski & Conture (2002)

They also reported weighted SLD scores for their two groups and classified them on a scale ranging from low to high degrees of normal fluency, and mild to severe manifestations of stuttering.

Severity Level	Weighted SLD	NS (total #) %	S (total #) %	
Normally Fluent--Low Disfluent	0-1.99	(39) 72%	0	Leo's SLD range from t26-t28 = 2,01-3,61
Normally Fluent--High Disfluent	2.00-3.99	(15) 28%	0	
Stuttering--Mild	4.00-9.99	0	(34) 38%	
Stuttering--Moderate	10.00-29.99	0	(42) 47%	
Stuttering--Severe	>/= 30.00	0	(14) 15%	

Table 25: Classification according to weighted SLD scores: Pellowski & Conture (2002)

Looking back on Leo's disfluency data in Tables 21 and 22, we can see in all three sessions his weighted SLD scores place him in the category marked in bold in Table 25, that of a "highly disfluent" but non-stuttering child. His weighted SLD score is on par

with the means given for the typically developing children, if at the high end of the range, and well below that reported for the stuttering children in both studies. The data indicates, then, that Leo does not appear to have a stuttering problem (at least at this stage in development), but that he does have a higher than usual level of disfluency, which raises interesting questions about the potential causes of this disfluency, and the interaction between impaired linguistic skills and fluency in general.

10.3 Relationship of fluency to other linguistic abilities

Interestingly, we can see in the weighted SLD score as well as the proportion of non-stuttering errors, that t26 (the monolingual Spanish context) sees the highest proportion of disfluency overall. This finding corresponds to those of studies of bilingual stutterers (e.g. Carias & Ingram (2006), and links between MLU and stuttering disfluency (Zackheim & Conture, 2003).

In their case study of 4 Spanish-English bilinguals with stuttering-like disfluency, Carias & Ingram (2006) found that all 4 of their subjects stuttered more in their dominant language (for two of these this was Spanish, and for the other two it was English). Specifically it was seen that each child showed higher rates of disfluency in the language in which they showed the greater MLU. They concluded that is a link between language proficiency, as measured in MLU, and disfluency; they further found that the most common type of disfluency in the children's dominant language was repetitions, whereas the weaker language showed more insertions and prolongations, and interpreted this finding to signify that repetitions occur when the child has more advanced language and has difficulties with the execution of the message plan, while insertions and prolongations occur when language knowledge is more limited and the speaker must "buy time" (p. 155).

In general, it appears that all disfluency is likely to occur when language knowledge is limited and/or language processing is overtaxed (which might be particularly relevant for bilingual child whose multiple languages demand greater processing resources). This

theory is described by the Demands and Capacities model (Starkweather, 1987)—which proposes that fluency arises when speaking demands exceed speech-production capacities—and by evidence such as that from Yairi (1993) who found a high number of disfluencies in child speech at the onset of more complex language that tended to decline after a six-month period.

With regards to SLI, the Demands and Capacities model might suggest an extended period of disfluency (beyond this initial period at the onset of complex language) due to prolonged difficulties in language processing. Hall (1996) studied 9 SLI children (ranging from 3;0 to 5;11 years in age) to determine a relationship between disfluency and language abilities and their interaction over time. She found evidence that fluency might be seen as a signal for variations in language development for SLI children, and particularly as a way to identify “dyssynchrony among linguistic abilities” (p. 27), such as better developed lexical than syntactic skills. Hall (1996) recommends the joint analysis of fluency with language abilities related to SLI, both for practical reasons of treatment and speech therapy, and because her findings suggest that fluency might be a useful tool in assessing abilities in SLI children, particularly if one monitors the linguistic loci of disfluent events. Although an assessment of the linguistic causes of disfluency is beyond the scope of the present study, recommendations from Hall (1996) will inform future studies of Leo’s language abilities and help change our perspective on disfluency: that is, instead of a detrimental “nuisance” to syntactic analysis, it may serve as a helpful instrument to locate the sources of Leo’s processing difficulties and identify the specific patterns of SLI in each language.

Conclusions

In conclusion, Leo's speech at age 4 shows evidence of SLI, and this disorder appears to be affecting his production of Spanish syntax by causing a larger than usual number of ungrammatical utterances; although his English skills are too limited for thorough analysis of syntactic abilities, the virtual absence of verbal morphology indicates that the disorder is affecting both of these languages, as it to be expected in bilingual SLI (Paradis *et al.*, 2003; Restrepo, 1998; Bedore & Peña 2008).

While it appears from our current sample that Leo makes the most errors in Spanish on verb forms, evidence from other research indicates that this may be the result of the task type (Simon-Cerejido & Gutiérrez-Clellen, 2007). Future study of Leo's linguistic abilities in Spanish must include controlled tasks designed to assess his abilities with clitic pronouns and articles in the noun phrase. If he does not appear to have difficulties in these areas, or if his abilities with verbs exceed his difficulties in noun phrase morphemes, we will focus future study on identifying those variables that cause him to differ from the expected patterns observed in SSLI in other bi- and monolingual children: these might be the type of input received (frequently mixed) and the acceptance of code-switching by Leo's adult interlocutors.

Further research will also continue to monitor the extent of Leo's fluency difficulties, particularly focusing on the linguistic loci of disfluent events, as evidence from Hall (1996) suggests that, for children with language disorders, disfluency might indicate dyssynchronous and changing abilities, and will help us better describe the manifestations of SLI in Leo's bilingual repertoire. Specifically, informal observations of the transcripts coded for fluency indicate that they may arise due to dyssynchrony between syntactic and pragmatic abilities: clusters of disfluent events appear to arise when the child is trying to engage in complicated discourse events such as telling a story about a past episode, or when he is under pressure to provide an explanation or justification. He makes valiant attempts to share complex stories, for example, and resorts to a number of different

strategies to evade his lexical and syntactic gaps (such as putting himself in the position of the different characters in the story and always speaking in the first person, thus avoid the need for reported speech or third person conjugation). This can be seen in the example taken from t26:

*CHI: la Cherry # dicho que ## “hmm a ver podemos (em)pujar esto coche azul, hmm” [^ stroking his chin and pretending to be his mother, Cherry].

Ideally, controlled experiments on the use of clitics and articles, along with an awareness of disfluency, will also help to reduce the amount of ambiguous data, in which it is unclear whether phrase abandonment, for example, is the result of lexical or syntactic gaps, as opposed to the simple changes of focus and limited attention span that are to be expected in a 4-year old child; an example of this type of ambiguity, frequent in our spontaneous language samples, can be seen below, as Leo interrupts himself while speaking to his father:

*CHI: no, <eso es> [/] eso es +//.

*CHI: ui@e se rompe [/] se rompe .

Because there is such limited research on both bilingual SLI and bilingual disfluency, a detailed examination of the interaction of these two elements in our bilingual subject might prove a valuable contribution to the field of BFLA, enabling us to isolate more variables that affect the way these phenomena are manifested and how they interact.

Bibliography

- Ambrose, N. G., & Yairi, E. (1999). Normative disfluency data for early childhood stuttering. *Journal of Speech, Language and Hearing Research*, 42: 895–909.
- Anderson, R.T. (2007) Exploring the Grammar of Spanish-speaking Children with Specific Language Impairment. In J. Centeno, L.K. Obler and R. T. Anderson (eds.) *Communication Disorders in Spanish Speakers: Theoretical, Research and Clinical Aspects* (pp 113-128). Multilingual Matters.
- Barquin (2006). Treball d'assignatura: Recerca aplicada a l'adquisició del llenguatge I. Doctorat: Comunicació Multilingüe. Universitat Pompeu Fabra. Barcelona
- Barquin (2007). Treball d'assignatura: Recerca aplicada a l'adquisició del llenguatge II. Doctorat: Comunicació Multilingüe. Universitat Pompeu Fabra. Barcelona
- Bates, E., Bretherton, I., & Snyder, L. (1988). *From first words to grammar: Individual differences and dissociable mechanisms*. New York: Cambridge University Press.
- Bates, E., Dale, P.S., & Thal, D. (1995). Individual differences and their implications for theories of language development. In P. Fletcher & B. MacWhinney (Eds.), *Handbook of child language* (pp. 96-151). Oxford: Basil Blackwell.
- Bedore, L.M. and Leonard, L.B. (2001) Grammatical morphology deficits in Spanish-speaking children with specific language impairment. *Journal of Speech, Language, and Hearing Research* . 44, 905_924.
- Bedore, L.M. and Leonard, L.B. (2005) Verb inflections and noun phrase morphology in the spontaneous speech of Spanish-speaking children with specific language impairment. *Applied Psycholinguistics*. 26 (2), 195_225.
- Bedore, L.M. & Peña, E.D. (2008) Assessment of Bilingual Children for Identification of Language Impairment: Current Findings and Implications for Practice. *The International Journal of Bilingual Education and Bilingualism*, 11(1).
- Bernstein Ratner, N. (2004). Fluency and stuttering in bilingual children. In B. Goldstein (ed.). *Language Development: a focus on the Spanish-English speaker*. Baltimore, MD: Brookes. (287-310).
- Bernstein Ratner, N., Rooney, B. and MacWhinney, B., 1996. Analysis of stuttering using CHILDES and CLAN. *Clinical Linguistics and Phonetics* 10, pp. 169–188.
- Brown, R. (1973) *A First Language: The Early Stages*. Cambridge: Harvard University Press.

- Carias, Sofia and Ingram, David(2006). Language and disfluency: Four case studies on Spanish-English bilingual children. *Journal of Multilingual Communication Disorders*, 4 (2): 149-157.
- Carlo, E., & Watson, J. (2003) Disfluencies of 3- and 5-year old Spanish-speaking children. *Journal of Fluency Disorders*, 28: 37-53.
- Caselli, M.C., Bates, E., Casadio, P., Fenson, J., Fenson, L., Sanderl, L., Weir, J. (1995) A cross-linguistic study of early lexical development. *Cognitive Development* 10 (2), 159_199.
- Caselli, M.C., Casadio, P. and Bates, E. (1999) A comparison of the transition from first words to grammar in English and Italian. *Journal of Child Language*, 26: 69-112.
- Clark, E. V. (1987) The principle of contrast: a constraint on language acquisition. In B. MacWhinney (ed.), *Mechanisms of language acquisition*. Hillsdale, NJ: Erlbaum.
- Clark, E. (1988) On the logic of contrast. *Journal of Child Language* 15, 317–35.
- Clark, E. (1993) *The Lexicon in Acquisition*. Cambridge: Cambridge University Press.
- Crystal, D. (1998) Sense: The final frontier. *Child Language Teaching and Therapy*, 14: 1-27.
- Crystal, D. (ed) (1995) *The Cambridge Encyclopedia of Language* (2nd ed. 2005) Cambridge University Press, Cambridge.
- De Houwer, A. (1990) *The Acquisition of Two Languages from Birth: A Case Study*. Cambridge: Cambridge University Press.
- De Houwer (1995). Bilingual Language Acquisition. In P. Fletcher & B. MacWhinney (eds) *The Handbook of Child Language*. Oxford: Blackwell.
- Deuchar, M. & Quay, S. (1999). Language choice in the earliest utterances: a case study with methodological implications. *Journal of Child Language*. 26(2): 461-75
- Deuchar, M., & Quay, S. (2000). *Bilingual acquisition: Theoretical implications of a case study*. Oxford: Oxford University Press.
- Döpke, S. (1992) *One parent–one language: an interactional approach*. Amsterdam: Benjamins
- Dopke, S. (1998) Can the principle of ‘One person – one language’ be disregarded as unrealistically elitist?. *Australian Review of Applied Linguistics*, 21(1): 41-56.
- Echeverría, M.S. (1979) Longitud del enunciado infantil: Factores ambientales e

individuales [Children's mean length of utterance: Environmental and individual factors]. In *Estudios Generales I. Actas del 5o. Seminario de Investigación y Enseñanza de la Lingüística y Universidad Técnica del Estado* (pp. 56_68). Santiago, Chile.

Fantini, A. (1985). *Language acquisition of a bilingual child*. San Diego: College-Hill Press.

Fenson, D., Dale, P., Reznick, J. S., Bates, E., Thal, D., & Pethick, S. (1994). Variability in early communicative development. *Monographs of the Society for Research in Child Development, Serial 59* (5, Serial No. 242).

Fenson, L., Dale, P., Reznick, S., Thal, D., Bates, E., Hartung, J., Pethick, S., & Reilly, J. (1993). *MacArthur Communicative Development Inventories*, San Diego, CA: Singular Publishing Group, Inc.

Genesee, F. (1989). Early bilingual development: One language or two? *Journal of Child Language*, 6: 161–179.

Genesee, F., Nicoladis, N., & Paradis, J. (1995). Language differentiation in early bilingual development. *Journal of Child Language*. 22: 611–631.

Genesee, F. (2001). Bilingual first language acquisition: Exploring the limits of the language faculty. *Annual Review of Applied Linguistics*. 21: 153-168.

Goldstein, B. (2006). Clinical Implications of Research on Language Development and Disorders in Bilingual Children. *Topics in Language Disorders*, 26 (4):305-321

Goodz, N.S. (1994) Interactions between parents and children in bilingual families. In F. Genesee (ed.), *Educating second language children*. New York: C.U.P.

Grosjean, François. 1998a. Studying bilinguals: Methodological and conceptual issues. *Bilingualism: Language and Cognition* 1:131-149.

Gutiérrez-Clellen, V. F., Restrepo, M. A., Bedore, L., Peña, E. S., & Anderson, R. (2000). Language sample analysis in Spanish speaking-children: Methodological considerations. *Language, Speech and Hearing Services in Schools*, 31, 88–98.

Hall, N. E. (1996). Language and fluency in child language disorders: Changes over time. *Journal of Fluency Disorders*, 21, 1 – 32.

Hick, R.F., Joseph, K.L., Conti-Ramsden, G., Serratrice, L. and Faragher, B. (2002) Vocabulary profiles of children with specific language impairment. *Child Language Teaching & Therapy* 18 (2), 165-180.

- Holowka, S., Brosseau-Lapre, F., Petitto, L.A. (2002). Semantic and conceptual knowledge underlying bilingual babies' first signs and words. *Language Learning*. 52(2): 205-262.
- Jackson-Maldonado, D., Thal, D., Marchman, V.A., Bates, E. and Gutierrez-Clellen, V. (1993) Early lexical development in Spanish-speaking infants and toddlers. *Journal of Child Language* 20 (3), 523_549.
- Jackson-Maldonado, D., & Conboy, B. T. (2007) Utterance Length Measures for Spanish-speaking Toddlers: The Morpheme versus Word Issue Revisited. In J. Centeno, L.K. Obler and R. T. Anderson (eds.) *Communication Disorders in Spanish Speakers: Theoretical, Research and Clinical Aspects* (pp 142-155). Multilingual Matters.
- Jacobson, P.F. and Schwartz, R.G. (2002) Morphology in incipient bilingual Spanish-speaking preschool children with specific language impairment. *Applied Psycholinguistics* 3 (1), 23-41.
- Juan-Garau, M., Perez-Vidal C. (2001) Mixing and pragmatic parental strategies in early bilingual acquisition. *Journal of Child Language*. 28: 59-86
- Junker, D., & Stockman, I. (2002). Expressive vocabulary of German–English bilingual toddlers. *American Journal of Speech-Language Pathology*, 11, 381 – 394.
- Lanvers, U. (1999). Lexical growth patterns in a bilingual infant: The occurrence and significance of equivalents in the bilingual lexicon. *International Journal of Bilingual Education and Bilingualism* 2(1): 30-52.
- Lanza (1992) Can bilingual two-year olds code-switch? *Journal of Child Language*.19: 633-58
- Lanza, E. (1997) *Language mixing in infant bilingualism*. Oxford: Clarendon Press.
- Leonard, L. B. (1997) *Children with Specific Language Impairment*. MIT Press.
- Leopold, W. (1939–49) *Speech Development of a Bilingual Child: A Linguist's Record* (4 Volumes: Vol.I: Vocabulary growth in the first two years. Vol.II: Sound learning in the first two years. Vol.III: Grammar and general problems. Vol.IV: Diary from age 2). Evanston: Northwest University Press.
- Lyon, J. (1996) What Factors Predict a Child's Language in a Bilingual Environment? In Michelle Aldridge (ed) *Child Language*. (pp 103-111). Multilingual Matters.
- MacWhinney, B. (2000). *The CHILDES Project: Tools for Analyzing Talk*. 3rd Edition. Mahwah, NJ: Lawrence Erlbaum Associates

Meisel (1990) (ed.) *Two first languages: early grammatical development in bilingual children*. Dordrecht: Floris.

Meisel, J. (1994). *Bilingual first language acquisition: French and German grammatical development*. Amsterdam: John Benjamins.

Nicoladis, E. & Genesee, F. (1996). A longitudinal study of pragmatic differentiation in young bilingual children. *Language Learning*, 46(3): 439-64.

Nwokah, E.E., 1988. The imbalance of stuttering behavior in bilingual speakers. *Journal of Fluency Disorders* 13, pp. 357–373.

O’Grady, W. (1987). *Principles of grammar learning*. Chicago: University of Chicago Press.

Paradis, J., & Genesee, F. (1996). Syntactic acquisition in bilingual children: Autonomous or interdependent? *Studies in Second Language Acquisition*, 18, 1–25.

Paradis, J., & Genesee, F. (1997). On continuity and the emergence of functional categories in bilingual firstlanguage acquisition. *Language Acquisition*, 62, 91–124.

Paradis, J. and Crago, M. (2001) The morphosyntax of specific language impairment in French: An extended optional default account. *Language Acquisition* 9 (4), 269_300.

Paradis, J., Crago, M., Genesee, F., & Rice, M. (2003). French-English bilingual children with SLI: How do they compare with their monolingual peers? *Journal of Speech, Language, and Hearing Research*, 46: 113-127

Patterson, J.L. (1998) Expressive vocabulary development and word combinations of Spanish-English bilingual toddlers. *American Journal of Speech Language Pathology* 7 (4), 46-56.

Patterson, J. L. (2002). Relationships of expressive vocabulary to frequency of reading and television experience among bilingual toddlers. *Applied Psycholinguistics*, 23, 493–508.

Paul, R. (2001) “Predicting outcomes of early expressive language delay: Ethical implications” In Dorothy V.M. Bishop, Laurence B Leonard (eds) *Speech and Language Impairments in Children: Causes, Characteristics, Intervention and Outcome*. Psychology Press.

Pearson, B.Z., Fernández, S. and Oller, D.K. (1993) Lexical development in bilingual infants and toddlers: Comparison to monolingual norms. *Language and Learning* 43 (1), 93-120.

Pearson, B. Z., Fernandez, S. C. & Oller, D. K. (1995). Cross-language synonyms in the lexicons of bilingual infants: one language or two? *Journal of Child Language*. 22: 345-

Pellowski, M.W., & Conture, E. G. (2002). Characteristics of speech disfluency and stuttering behaviors in 3- and 4-year-old children. *Journal of Speech, Language, and Hearing Research*, 45: 20–34.

Penner, Z., Schulz, P. and Wymann, K. (2003) Learning the meaning of verbs: What distinguishes language-impaired from normally developing children? *Linguistics* 41 (2), 289_319.

Peña, E., Bedore, L., & Zlatic-Giunta, R. (2002). Category generation performance of bilingual children: The influence of condition, category, and language. *Journal of Speech, Language, and Hearing Research*, 45, 938–947.

Quay, S. (1995). The bilingual lexicon: implications for studies of language choice. *Journal of Child Language*. 22: 369-387

Ramos, E. (2007) Speech and Language Assessment in Bilinguals. In Alfredo Aldila and Elaine Ramos (eds.) *Speech and Language Disorders in Bilinguals*. (pp 181-194). Nova Science Publishers, Inc.

Redlinger, W. E. & Park, T. (1980). Language mixing in young bilinguals. *Journal of Child Language*, 7: 337-52.

Rescorla, L. (1989). The Language Development Survey: A screening tool for delayed language in toddlers. *Journal of Speech and Hearing Disorders*, 54, 587–599.

Rescorla, L., Roberts, J., & Dahlsgaard, K. (1997). Late talkers at 2: Outcome at age 3. *Journal of Speech, Language, and Hearing Research*, 40, 556–566.

Restrepo, M.A. (1998). Identifiers of predominantly Spanish-speaking children with language impairment. *Journal of Speech, Language, and Hearing Research*, 41: 1398-1411.

Restrepo, M.A. and Kruth, K. (2000) Grammatical characteristics of a Spanish-English bilingual child with specific language impairment. *Communication Disorders Quarterly* 21 (2), 66-76.

Restrepo, M.A. and Gutierrez-Clellen, V. (2001) Article use in Spanish-speaking children with specific language impairment. *Journal of Child Language* 28 (2), 433-452.

Restrepo, M. A., & Gutiérrez-Clellen, V. F. (2004). Grammatical impairments in Spanish–English bilingual children. In B. Goldstein (Ed.), *Bilingual language development and disorders in Spanish–English speakers* (pp. 213–234). Baltimore, MD: Brookes.

Rice, M.L. and Wexler, K. (1996) Toward tense as a clinical marker of specific language impairment in English-speaking children. *Journal of Speech & Hearing Research* 39 (6), 1239_1257.

Rice, M.L., Wexler, K., Marquis, J. and Hershberger, S. (2000) Acquisition of irregular past tense by children with specific language impairment. *Journal of Speech Language and Hearing Research* 43 (5), 1126_1145.

Ronjat, J. (1913) *Le Développement du langage observé chez un enfant bilingue*. Paris: Champion.

Serra, M., Serrat, E., Sol´e, R., Bel, A., & Aparici, M. (2000). *La adquisición del lenguaje* [Language acquisition]. Barcelona: Editorial Ariel S.A.

Simon-Cerejido, G., & Gutiérrez-Clellen, V. (2007). Spontaneous language markers of Spanish language impairment. *Applied Psycholinguistics*, 28: 317-339.

Starkweather, 1987. *Fluency and stuttering*. Englewood Cliffs, NJ: Prentice-Hall, Inc.

Swain, M. (1972). *Bilingualism as a first language*. Ph.D. dissertation, University of California, Irvine.

Thal, D., Bates, E., Goodman, J., & Jahn-Samilo, J. (1997). Continuity of Language Abilities: An Exploratory Study of Late- and Early-Talking Toddlers. *Developmental Neuropsychology*, 13(3): 239:273.

Thordardottir, E.T. (2005) Early lexical and syntactic development in Quebec French and English: Implications for cross-linguistic and bilingual assessment. *International Journal of Language & Communication Disorders* 40 (3), 244_276.

Thordardottir, E. Rothenberg, A. Rivard, M.-E. Naves, R. (2006). Bilingual assessment: Can overall proficiency be estimated from separate measurement of two languages? *Journal of Multilingual Communication Disorders* 4 (1):1-21.

Vihman, M. M. (1985). Language differentiation by the bilingual infant. *Journal of Child Language* . 12: 297-324

Volterra, V., & Taeschner, T. (1978). The acquisition and development of language by bilingual children. *Journal of Child Language*. 5, 311–326.

Wexler, K. B., & Mysak, E. D. (1982). Disfluency characteristics of 2-, 4-, and 6-year old males. *Journal of Fluency Disorders*, 7: 37–46.

Yairi E., & Ambrose, N. (1992). Onset of stuttering in preschool children: selected factors. *Journal of Speech and Hearing Research*, 35(4), 782–788.

Yamamoto, M. (1995) Bilingualism in international families. *Journal of Multilingual and Multicultural Development* 16: 63–85.

Zackheim, C., & Conture, E. G. (2003). Childhood stuttering and speech disfluencies in relation to children's mean length of utterance: a preliminary study. *Journal of Fluency Disorders*, 28: 115-142.

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Appendix I: Chat symbols used in transcription

PHENOMENA	SYMBOL OR EXAMPLE
Overlapping sentences:	[<]. [>].
Half pronounced word	mi(ra); (por)que?
Child-invented form	@c crackor@c (meaning tractor)
Self-interruption (when the same speaker stops themselves and starts a new utterance)	+//. or +//?
Uninvited Interruption (when the utterance is incomplete because one speaker is interrupted by another speaker)	+/. or +/? +,
Trailing off	+...
Trailing off with a question	+..?
Trailing off with an exclamation	+..!
Repetition of a word to only count it as one element	como [/] co(mo) [/] como miffy
Simple Events (to insert a quick event into an utterance)	&=cough &=laugh &=crying
Simple transitive/referential events	&=imit:motor &=ges:unsure &=point:nose &=turn:page
Complex Events	[^ longer action] [^ sits down on the floor]
Explanatory text	[= explanation]
Unfilled pauses	# ; ## ; ###
Quoted Utterance	+”
Quotation follows on next line	+”/.
Quotation over several lines	+” please give me your honey. the little bear said +”.
Unintelligible speech that may be two or more words (not counted in MLU-w)	xxx

Unintelligible speech treated as word (counted in MLU-w)	xx
Unintelligible word with description on %pho line	yy
Ambiguous sounds not counted as words and transliterated	&gluk &gluk
Ambiguous sounding words with rough transcription, counted as words	ba@u
Made up words for playing	goobarumba@wp
Best Guess	[?]
Alternative for a single word	[=? word]
Alternative for a whole segment	%alt: explanation
Actions without words	0
Untranscribed Material	www
Non-word Exclamations	ah ahhah aw mmm ouch tut (pity) uhoh vroom yea (cheering)
Interjections	hmm hmm? mmhmm nuhuh uhuh uhhuh

Appendix II: Categorization and interpretation of disfluency

The fluency errors in Leo’s speech were classified in the transcriptions as belonging to one of the 6 specific categories below (the same table that can be found in chapter 10 of this study), using the code %flu below the error line, as can be seen in the sample transcript in Appendix III.

Type of Disfluency	Example
Stuttering-like disfluencies (SLD)	
part-word repetition (PWR):	“b-but”; “thi-thi-this”
single-syllable word repetition (SWR)	“yo yo yo”; “and and”
disrhythmic phonation (DP)	prolongations: “mmy”; “coookie” blocks: “#toy” broken words: “o#pen”
Other disfluencies (OD)	
interjection	“um”; “eh”
revision/abandoned utterances	“Mom ate/Mom fixed dinner” “I want/Hey look at that”
multisyllable/phrase repetition	“because because”; “I want I want to go”

Notes on categorization and interpretation:

-The first three categories were combined to yield the measure stuttering-like disfluencies (SLD).

-The second three categories were also combined and labeled as other disfluencies (OD).

-If more than one disfluency type occurred in a word, each was counted to provide accurate representation of the child's disfluent speech. For example, bu-bu-bu-but-but yielded counts of part-word and single-syllable word repetition.

-The number of extra times a segment was repeated for part- and single-syllable word repetition was also tabulated as repetition units (b-b-b-but = 3 units, and and = 1 unit).

Appendix III: Sample CHAT transcript: t26

(with fluency error codes)

@Begin
@Languages: en, es, ca
@Participants: CHI Leo_Child Target, FAT Pablo_Father.
@Birth of CHI: 23-JUL-2004
@Location: Barcelona, SPAIN
@Date: 21-JUN-2008
@Age of CHI: 3;10.27
@ID: en|barquin|CHI|3;10.27|male|||Target||t26|
@Situation: FAT and CHI are playing with cars in living room.
@Activities: Playing with cars and blocks.
*FAT: xxx el hombre ese.
*CHI: donde esta?
*FAT: ah la puse yo arriba en la [/] en la [/] en la cocina.
*CHI: no la veo.
*FAT: no la cosa esta muy arriba.
*FAT: la puse muy arriba.
*FAT: bueno Mamo, hacemos un castillo?
*FAT: quien maneja los tractores?
*CHI: yo.
*CHI: con mi tractor [= puts plastic bucket on head]!
*CHI: ay@e no veo nada!
%flu: [ITJ]
*FAT: ay@e no espera # esta para atras # alli va.
*CHI: que eso [/] # eso es <un &ti> [/] para ver todo
[= turning it around to the side without a sticker].
%flu: [M/PR]
%flu: [RV/A]
*FAT: hay un?
*CHI: eso para ver todo.
*FAT: ah claro una ventana.
*CHI: 0[^ singing inside bucket].
*CHI: que?
*CHI: <tu [/] tu hace el tractor y [/] y> [/] tu hace el tractor y yo [/]
yo [/] yo [/] yo voy a &ma &ma ma(ne)jar mi tractor ## vale?
%flu: [SWR]x1
%flu: [SWR]x1
%flu: [RV/A]
%flu: [SWR]x3
%flu: [PWR]x2
*FAT: vale.
%act: child exits singing with bucket on head
*FAT: a ver señor tractor necesita xx para hacer el castillo.

*CHI: a(ho)ra [/] &a ahora vengo!
 %flu: [M/PR]
 %flu: [PWR]x1
 *FAT: Leo.
 *FAT: hola.
 *FAT: xx deja los otros tractores?
 *CHI: yo esa.
 *FAT: y hacemos xxx arriba el castillo.
 *CHI: yo [/] yo beepbeep@o .
 %flu: [SWR]x1
 %flu: [RV/A]
 *CHI: el coche aqui no, ## aqui.
 *FAT: aqui?
 *FAT: ok.
 *FAT: xxx.
 *CHI: xxx.
 *CHI: fuera.
 *CHI: donde?
 *FAT: aqui, hacemos asi la pared, vale?
 *FAT: aqui, ok, necesito mas.
 *FAT: del rojo alli mira.
 *FAT: para.
 *FAT: ahora, asi entran mas.
 *FAT: xxx [<].
 *CHI: no, no, no hay eso [>]!
 *FAT: [^ child knocks down blocks] wow, muchas gracias señor tractor.
 *CHI: mucho no!
 *FAT: no [<].
 *CHI: solo uno [>]!
 *CHI: solo uno vale!
 *FAT: vale.
 *CHI: asi, dos.
 *FAT: dos, muy bien.
 *FAT: woah@i woah@i woah@i!
 *FAT: ok, bueno.
 *CHI: se levanta solo el [/] el xx solo!
 %flu: [SWR]x1
 *FAT: se levanta solo, que fuerte [>].
 *FAT: de los largos necesito +...
 *CHI: eso para [/] para xx.
 %flu: [M/PR]
 *FAT: uh huh.
 *CHI: aqui!
 *FAT: muy bien.
 *FAT: aca trae estos largos # los largos xx.
 *CHI: dame mas.

*FAT: donde van?
 *CHI: aqui.
 *FAT: no pero vamos a la otra pared ## aca.
 *CHI: aca.
 *CHI: beepbeepbeep@o &=imit:motor !
 *CHI: permiso!
 *FAT: gracias, aqui señor.
 *CHI: no saca una foto # estamos jugando.
 *FAT: si.
 *CHI: no saca una foto.
 *FAT: no, esta asi sacando la foto.
 *FAT: bueno, seguimos ## donde va esta?
 *CHI: aqui.
 *CHI: &=imit:motor .
 *CHI: no, eso no es asi!
 *FAT: para que xxx.
 *CHI: eso para [/] para el stop!
 %flu: [M/PR]
 *CHI: es una luz.
 *FAT: hay es una luz eso?
 *CHI: si &=imit:motor .
 *CHI: eso es para [/] para xx asi.
 %flu: [M/PR]
 *FAT: eh?
 *CHI: <&eh@i &si &tu &eh@i> [/] coche &=imit:motor baf@o [/] baf@o fuego!
 %flu: [ITJ]
 %flu: [ITJ]
 %flu: [RV/A]
 %flu: [ITJ]
 *FAT: fuego en donde en +/.
 *CHI: y [/] y [/] y eso para xx asi.
 %flu: [SWR]x2
 *FAT: el [/] el qual # ah este?
 *CHI: xx lado.
 *CHI: se pone aqui a la xx.
 *CHI: si, porque si se rompe una cosa xxx.
 *CHI: toma.
 *FAT: gracias.
 *CHI: tengo mas!
 *FAT: oh, gracias &=imit:motor .
 *CHI: que quiere?
 *CHI: yo xx uno de esos xxx.
 *CHI: y que quiere alla xxx.
 *FAT: hmm?
 *CHI: aqui.
 *FAT: yo voy alli.

*CHI: no porque, mira un agujero <muy &peque>
 [/] muy pequeño xxx, y que no puede entrar.

%flu: [M/PR]

*FAT: ah, no a ver si podemos meter otro xx.

*FAT: este wagon, no?

*CHI: si, este xxx.

*CHI: ahora xx no, eso esta +...

%flu: [RV/A]

*FAT: no, ese no.

*CHI: es mas grande +/.

*FAT: a ver si alli [>].

*CHI: mira [/], mira el xxx.

*FAT: este?

*CHI: si, a ver.

*FAT: pero este no tiene para [/] para +...

*FAT: a ver, probamos?

*CHI: mira, llega un poquito.

*CHI: mira llega.

*FAT: ah si, un poquito nos llega?

*CHI: xxx.

*FAT: ok, y ahora +/.

*CHI: toma [/], toma el carrito!

*FAT: oh gracias.

*CHI: puedes llevar bloques.

*FAT: alli va, lo cargamos aqui.

*CHI: si.

*CHI: de nada!

*FAT: gracias.

*CHI: oye xxx [+/]

%flu: [RV/A]

*CHI: no yo te pongo!

*FAT: ah vale, vale.

*CHI: ya esta.

*FAT: ya esta?

*CHI: <no hace > [/] ## espera ## no hace &=imit:motor ?

%flu: [RV/A]

*FAT: &=imit:motor .

*CHI: no, ahora hace &=imit:motor .

*FAT: como vamos a montar las paredes ahora?

*CHI: no hace &=imit:motor, y (des)pues [^ making lots of different traffic sounds and then switches to train sounds].

%flu: [RV/A]

*CHI: se va muy rapido!

*FAT: se va muy rapido el tren?

*CHI: si y (des)pues se va a chocar asi bof@o !

*FAT: y contra quien choca?

*CHI: con eso.
 *FAT: wow.
 *FAT: bueno, hacemos los paredes gordo?
 *CHI: si.
 *CHI: yo [/] yo [/] yo te aguanto eso para asi no se cae, vale?
 %flu: [SWR]x2
 *FAT: vale.
 *CHI: y para tractores tambien!
 *FAT: si, para todo.
 *FAT: quieres poner vos?
 *CHI: si.
 *CHI: ahora tu pone en mi tractor.
 *FAT: vale.
 *CHI: tu pone en mi tractor este.
 *FAT: xxx.
 *CHI: y tu +//.
 *CHI: no [/], no!
 *CHI: esto es ## +//.
 *CHI: papi mio!
 *FAT: claro, bueno pero jugando aqui yo hago de grua, como si fuera la grua.
 *CHI: <y [/] y la grua s(e) levanta> [/] yo vi una grua que levantado
 xxx porque se ha rompida una rueda y (des)pues &=imit:motor
 [^ pretending hand is a crane, lifts tractor into the air] .
 %flu: [SWR]x1
 %flu: [RV/A]
 %flu: [RV/A]
 *CHI: una grua xx.
 *FAT: xxx que levanta un tractor?
 *CHI: no, una grua!
 *FAT: mmhmm [<].
 *CHI: no, con un coche de carrera [>].
 *FAT: ah, xx choquó el coche [<]?
 *CHI: si, y (des)pues salio la rueda [<]!
 *FAT: se salio la reuda del coche?
 *CHI: si [<].
 *FAT: ah [>].
 *FAT: y como le ha levantado la grua el coche?
 *CHI: asi, con el gancho [^ mimics the crane lifting].
 *FAT: que guai.
 *CHI: <y no puede mas porque> [/] no puede mas ## hace &=imit:motor ## porque se
 ha pinchado.
 %flu: [RV/A]
 %flu: [ITJ]
 *FAT: se ha pinchado.
 *CHI: y (des)pues se salio &pue +//.
 %flu: [RV/A]

*CHI: la Nuria pincho una rueda de [/] de su moto!
 %flu: [SWR]x1
 *FAT: ah si.
 *CHI: la Nuria!
 *FAT: la Nuria.
 *CHI: la Nuria moto.
 *FAT: la moto de Nuria.
 *CHI: y (des)pues &=imit:motor xx [^ falls to the floor miming a moto accident] .
 *CHI: la Nuria +/.
 *FAT: se cayó [<]?
 *CHI: si [>].
 *FAT: oh pobre Nuria.
 *CHI: y (des)pues vengo la [/] la policia y la ambulancia!
 %flu: [SWR]x1
 *FAT: ah si, woah@i entonces fue un accidente grave!
 *CHI: papi?
 *FAT: que?
 *CHI: <si> [/] y aqui?
 %flu: [RV/A]
 *FAT: alli tienes que poner todo arriba para que xxx la pared.
 *CHI: y aqui +/.
 *FAT: alli van los coches.
 *CHI: <no &es> [/] ## no +...
 %flu: [RV/A]
 %flu: [RV/A]
 *CHI: y donde va a pasar el coche?
 *FAT: aqui al xxx por aqui.
 *CHI: <con tu &n> [/] no la [/] la coches no salen por las puertas.
 %flu: [RV/A]
 %flu: [SWR]x1
 *FAT: ah no?
 *CHI: salen por un [/] un [/] un agujero muy grande.
 %flu: [SWR]x2
 *FAT: mmm.
 *CHI: no, sale con xx puerta.
 *CHI: xxx eso encima.
 *CHI: eso ## xx esos aqui atras!
 *FAT: mmm, aqui mira.
 *CHI: uno para ti.
 *FAT: otra ponemos?
 *CHI: si.
 *FAT: vale.
 *CHI: llega esto coche.
 *FAT: hmm?
 *CHI: no llega la cam(ion)eta.
 *CHI: xx la cam(ion)eta negra.

*CHI: no, la cam(ion)eta negra.
 *FAT: wow.
 *CHI: no, es [/] es negra y xx uno de estos.
 %flu: [SWR]x1
 *CHI: no lleva nada.
 *FAT: no lleva nada?
 *CHI: lleva [/] lleva esto.
 %flu: [M/PR]
 *CHI: xxx.
 *CHI: y ayuda la tractores, la gruas, todo eso.
 *FAT: ayuda todo eso?
 *CHI: ahora [/] ahora trae una cosa aqui atras para tu!
 %flu: [M/PR]
 *FAT: ah si, o gracias, viene la grua y &=imit:motor .
 *FAT: necesito mas bloques!
 *CHI: ah@i, me he caido.
 %flu: [ITJ]
 *CHI: &ese eso atras!
 %flu: [RV/A]
 *FAT: para atras, si.
 *CHI: aqui!
 *CHI: ay@e, me he caido otra vez!
 *CHI: vas con el coche &=imit:motor !
 *FAT: ok, gracias.
 *CHI: <falta mas> [/] falta # mas blockes?
 %flu: [M/PR]
 %flu: [DP]
 *FAT: si, por favor.
 *CHI: &=imit:motor paso una puerta?
 *FAT: mmhmm.
 *CHI: vale.
 *CHI: &=imit:motor oh@i no se va el [/] la coche.
 %flu: [RV/A]
 %flu: [ITJ]
 *FAT: ohno@e, ven pa(ra) aqui coche.
 *CHI: no viene!
 *FAT: no viene, que cosa xxx.
 *CHI: oh@i, oh@i yo puedo, mira [^ crawls over and gets the car] !
 %flu: [ITJ]
 %flu: [ITJ]
 *CHI: toma # coche [>].
 *FAT: gracias [<].
 *CHI: es tu coche.
 *FAT: gracias.
 *CHI: &beepbeep [x 5] ## faltan mas bloques?
 *FAT: si, por favor.

*CHI: uno, aqui arriba.
 *CHI: dos.
 *CHI: tres.
 *CHI: &cu &cuatro .
 %flu: [PWR]x1
 *FAT: oh.
 *CHI: ah@i espera ## para aqui +...
 %flu: [RV/A]
 %flu: [ITJ]
 *CHI: &=imit:motor yo llevo xx.
 *FAT: gracias!
 *CHI: yo llevo una grande y una +...
 %flu: [RV/A]
 *CHI: ahora [/] ahora tu puede mi coche y yo la +...
 %flu: [M/PR]
 %flu: [RV/A]
 *FAT: la +/.
 *CHI: tu puede ## tractor &eh@i +...
 %flu: [DP]
 %flu: [RV/A]
 %flu: [ITJ]
 *CHI: no pone aqui, pones aqui.
 *FAT: vale.
 *CHI: ahora yo xxx tu tractor.
 *FAT: mi tractor?
 *CHI: si.
 *CHI: donde esta?
 *FAT: eso xxx.
 *CHI: oh@i.
 *CHI: yo xxx eso atras, vale?
 *FAT: &=imit:motor alli viene otro &=imit:motor !
 *CHI: &beepbeep !
 *CHI: pega!
 *CHI: dale!
 *CHI: <tu puede &empu> tu &pue +...
 %flu: [RV/A]
 %flu: [RV/A]
 *FAT: yo lo dejo aqui y lo uno con el tractor, vale?
 *CHI: si.
 *FAT: oy@e, se la xxx.
 *CHI: ay@e, xxx vamos!
 *CHI: (a)rrancate motor.
 *CHI: vamos xxx.
 *CHI: no puedo bajar lo yo!
 *FAT: no?
 *CHI: no!

*CHI: ay@e, espera.
 *CHI: oy@e, <no hay> [/] no hay mas sitio!
 %flu: [M/PR]
 *FAT: bueno entonces ahora, arriba.
 *CHI: no esta alli [/] ## aca [/] ## aqui.
 *CHI: faltó mas!
 *CHI: no puedo bajarlo yo!
 *FAT: eh@i?
 *CHI: no puedo bajar yo.
 *CHI: eh@e, mira papi.
 *FAT: hmm@i?
 *CHI: mira que hace yo.
 *FAT: wow, que guai.
 *FAT: muy bien gordo [<].
 *CHI: <se rompe> [/] se rompe [<].
 %flu: [M/PR]
 *FAT: eh@i [>] ?
 *FAT: se rompe, y asi?
 *FAT: wow, muy bien gordo.
 *CHI: &si ## no puedo bajarlo yo!
 *FAT: &=imit:motor .
 *CHI: no puedo bajarlo yo.
 *CHI: si lleva dos.
 *CHI: uno aqui.
 *CHI: no puedo bajarlo!
 *FAT: creo que ya me dijiste eso.
 *CHI: eh@i, eso encima xxx.
 %flu: [ITJ]
 *CHI: <eso no> [/] # eso no la (nece)sito!
 %flu: [M/PR]
 *FAT: ah vale dejalo al tractor amarillo que se lo lleva.
 *CHI: (nece)sito llevar dos?
 *FAT: no se, usted necesita mas?
 *CHI: si.
 *FAT: vale.
 *CHI: y xx no mucho sitio.
 *CHI: no hay mas sitio aqui!
 *CHI: <mas> [/] un poco lejos.
 %flu: [RV/A]
 *FAT: ok, ya esta?
 *CHI: donde esta la cherry?
 *FAT: la cherry fue a perignon a tocar.
 *CHI: y quien xxx [^ makes hand motions and car sounds to indicate driving]?
 %flu: [RV/A]
 *FAT: ah, el quentin a alquilado una camioneta.
 *CHI: no, un coche!

*FAT: ah un coche, oh [<]?
 *CHI: si [>].
 *FAT: pensé que era una camioneta o furgoneta.
 *CHI: no.
 *FAT: no.
 *CHI: no, es un coche.
 *FAT: un coche coche?
 *CHI: &=head:yes .
 *FAT: y va muy rapido?
 *CHI: no.
 *FAT: no?
 *CHI: es azul, el color azul.
 *FAT: ah, de color azul?
 *CHI: si.
 *FAT: y vos como sabes?
 *FAT: lo viste?
 *CHI: si.
 *CHI: la cherry [^ stroking chin and thinking, pretending to be cherry]
 dicho que, hmm@i a ver podemos (em)pujar esto coche azul, hmm@i.
 %flu: [ITJ]
 %flu: [ITJ]
 *FAT: ah.
 *FAT: hmm.
 *CHI: y dicho ah@i xxx!
 %flu: [ITJ]
 *CHI: &no, &m la Mamo esta, xx asi puedo &ayudan ayuda al quentin estas
 coche.
 %flu: [PWR]x1
 %flu: [RV/A]
 %flu: [M/PR]
 *CHI: ah@i, xxx.
 %flu: [ITJ]
 *CHI: no hay mas sitio!
 *FAT: esto lo vamos a tener que poner arriba.
 *CHI: no, <eso es> [/] eso es +//.
 %flu: [M/PR]
 %flu: [RV/A]
 *CHI: ui@e se rompe [/] se rompe.
 %flu: [M/PR]
 *FAT: mmm.
 *CHI: <eso es un> [/] # eso para meter tractores ## y coches [<].
 %flu: [RV/A]
 *FAT: ah, vale, vale [>].
 *CHI: xx hay coches y tractores grandes no, pequeños tractores.
 *CHI: <y es> [/] &trac ## tractores grande.
 %flu: [RV/A]

%flu: [PWR]x1
 %flu: [DP]
 *CHI: que eso?
 *FAT: mas.
 *CHI: eso para poner aqui atras.
 *CHI: si?
 *FAT: mmhmm.
 *CHI: voy a poner xx aqui atras?
 *FAT: mmhmm.
 *CHI: ah@i, vale.
 %flu: [ITJ]
 *CHI: (nece)sito mas!
 *FAT: mas, pequeño o grandes?
 *CHI: grandes.
 *FAT: &=imit:motor .
 *CHI: tira!
 *CHI: eso es roto.
 *FAT: que no lo usas?
 *CHI: no porque # eso es roto.
 *FAT: ah, vale.
 *CHI: &=imit:motor mira eso &=imit:motor .
 *FAT: mmhmm.
 *CHI: xxx.
 *FAT: oh [^ music begins playing in the background, coming from the neighbors] !
 *CHI: que eso?
 *FAT: eso es una flauta.
 *CHI: donde viene?
 *FAT: de alli # alguien debe estar tocando la flauta.
 *CHI: no la veo.
 *FAT: no, pero estara fuera xx.
 *FAT: pero tranqui, xxx.
 *CHI: que?
 *FAT: que es para escuchar, no es para ver.
 *CHI: ay@e , donde esta?
 %flu: [ITJ]
 *FAT: afuera.
 *CHI: no la veo.
 *FAT: es que xxx hay muchos xx afuera.
 *CHI: alli abajo?
 *FAT: no [/] no, no se.
 *FAT: vamos a xx una pieza con esto?
 *CHI: si.
 *CHI: se ha rotpido una cosa!
 *CHI: me rompio mi rueda [<]!
 *FAT: oyoyoi [>].
 *FAT: pongalo aqui.

*FAT: asi?
 *CHI: si.
 *CHI: ya esta!
 *FAT: ok.
 *CHI: y eso rueda tambien!
 *FAT: esa rueda tambien Mamo, ok.
 *CHI: ya esta!
 *FAT: ah, atrapado.
 *CHI: no quiero mas.
 *CHI: ahora alli xxx lado!
 *FAT: ok.
 *CHI: y (nece)sito mas!
 *FAT: mas, asi?
 *CHI: si.
 *CHI: vamos!
 *FAT: para que +...
 *CHI: tira!
 *FAT: esa.
 *CHI: xx, donde voy a ponerlo?
 *FAT: espera, que tienes que ponerla arriba gordo.
 *CHI: alli.
 *FAT: atras, eso no es xxx.
 *CHI: <no hay> [/ -] tu la pone aqui +/.
 %flu: [RV/A]
 *FAT: por arriba &=yawn ?
 *CHI: y yo [/] yo pono aqui adentro y tu la subes, vale?
 %flu: [SWR]x1
 *FAT: ok.
 *CHI: xx la (em)pujas.
 *CHI: mira, elisa.
 *FAT: wow, se va solo.
 *CHI: ow@e, que la choqué.
 *CHI: se choqué!
 *CHI: no, yo!
 *FAT: yo le estaba haciendo.
 *CHI: no yo la empuja y xxx +...
 %flu: [RV/A]
 *FAT: oh vale vale vale, bueno pero necesito bloques señor tractor.
 *CHI: no, con eso tractor.
 *CHI: esos tractores.
 *FAT: xxx hacen.
 *CHI: espera, voy a xx mi tractor vale?
 *FAT: vale.
 *CHI: [^ gets up and puts bucket on head] no veo nada.
 *FAT: alli.
 %exp: child gets up and leaves room with bucket on head, pretending to be

tractor. tractor sounds can be heard from kitchen.

*FAT: a ver Mamo.

*FAT: que estas xx?

*CHI: [^ enters room again] &beepbeep !

*FAT: hola señor tractor.

*CHI: &=imit:motor que (le)vanto coches!

%act: picks up cars and carries them away

*FAT: y alli lo dejas?

*FAT: pobre coche, como va a bajar?

*CHI: no, coge asi [/] ## asi se va para .

%flu: [M/PR]

*FAT: mmm.

*FAT: a ver Mamo, venid, vamos a terminar el castillo?

%exp: ignoring comment, child goes to pick up a book and hands it to father

*FAT: wow, y eso que es un libro nuevo?

%act: child leaves room again making tractor sounds

*FAT: Mamo!

*CHI: ahora vengo!

*FAT: ok.

*CHI: (nece)sito xx.

*FAT: espera para donde vas?

*CHI: (nece)sito xx lo eso con mi tractor.

*FAT: eh@i?

*CHI: que se va a perder.

*FAT: ah vale, bueno guarda eso.

*FAT: señor tractor tome, el libro para guardar &=imit:motor [^ hands book back].

*CHI: <yo> [/] <con mi &trac> [/] <no es> [/] no coge mi tractor porque esta alli [^ points to kitchen].

%flu: [RV/A]

%flu: [RV/A]

%flu: [RV/A]

*FAT: ah vale vale, vas a xxx a coger el tractor.

%act: child leaves room again

*FAT: hoy me parece que va a ser un dia passiva, eh@i?

*FAT: ok, señor, ei, tractor tiene que guardar este libro.

*CHI: 0 [^ begins backing up and turning].

*FAT: ah, estas maniobrando?

*CHI: &=nod [^ takes book and puts it away].

*FAT: ok.

*CHI: 0 [^ leaves room again].

*FAT: Leo?

*CHI: ya vengo!

*FAT: hola, ya dejaste el tractor?

*CHI: si por alli.

*FAT: lo estacionaste bien?

*CHI: si, a mi casa.

*FAT: en tu casa?
 *CHI: si.
 *FAT: ah, vale.
 *CHI: y [/] y que xxx.
 %flu: [SWR]x1
 *CHI: <tu quiere> [/] tu quiere llevar mi tractor?
 %flu: [M/PR]
 *FAT: eh@i?
 *CHI: tu quiere llevar mi tractor?
 *CHI: <no la pones> [/] yo te pongo <que no> [/] que no xxx.
 %flu: [RV/A]
 %flu: [RV/A]
 %flu: [M/PR]
 *FAT: mmhmm.
 *CHI: yo quiero usar el tiron en el tractor.
 *FAT: ok, ya estoy?
 *CHI: si, ahora vas.
 *FAT: &=imit:motor .
 *CHI: no, a mi tractor!
 *FAT: ay, es que Mamo, tengo que decirte la verdad.
 *CHI: si?
 *FAT: no tengo licencia de conducir.
 *CHI: tengo un [/] la llave aqui.
 %flu: [RV/A]
 *FAT: ah, tienes la llave alli.
 *CHI: toma la llave.
 %exp: father takes bucket off head and begins playing it like a drum.
 *CHI: no, no es un tambor.
 *CHI: no, mi &trac xxx +...
 %flu: [RV/A]
 *FAT: porque señor necesito tractor, que [^ grabs child and begins kissing him, child puts the bucket back on father's head] ?
 *FAT: oh, pero yo no se manejar un tractor.
 *FAT: no se manejar tractor, nunca he manejado un tractor yo.
 *CHI: <yo &p> [/] tu puede.
 %flu: [RV/A]
 *FAT: me puedes enseñar?
 *CHI: si.
 *FAT: a ver como se maneja un tractor.
 *FAT: a ver.
 *CHI: dame la llave!
 *FAT: ah, toma la llave.
 %exp: child puts bucket on his head and goes back to the kitchen.
 *CHI: xxx alli (des)pues tu sube a mi tractor, vale?
 *FAT: vale.
 *CHI: &=imit:motor .

*FAT: wow, viene manejando para atras.
 *FAT: eh@i, el tio si que sabe.
 *FAT: hola!
 *FAT: que rapido que veniste en tractor!
 %exp: child takes bucket off own head.
 *FAT: es un tractor de carrera?
 *CHI: no.
 *FAT: no?
 *CHI: es un tractor &m ## muy suave.
 %flu: [PWR]x1
 %flu: [DP]
 *FAT: muy suave?
 *CHI: tu pone esto, asi [^ puts bucket on father's head] .
 *FAT: ok.
 *CHI: (es)pera.
 *FAT: ya estoy?
 *CHI: si, ya esta.
 *FAT: ok, y ahora que hago?
 *CHI: sube un tractor.
 *CHI: te pone asi tiron.
 *CHI: no, no espera [^ moves blocks out of the way].
 *FAT: ah gracias.
 *FAT: gracias.
 *CHI: ahora +...
 %flu: [RV/A]
 *CHI: va m(an)aja!
 *FAT: ah, manejo &=imit:race-car .
 *CHI: no, no hace &=imit:tractor .
 *FAT: ah, &=imit:tractor .
 *FAT: asi esta bien?
 *CHI: si.
 *FAT: &=imit:tractor voy a chocar, voy a chocar Leo!
 *FAT: ok, estaciono?
 *CHI: si, yo la estaciono en mi casa.
 *FAT: vale, toma la llave, que no vas xxx sin las llaves.
 *FAT: las llaves del tractor señor.
 *CHI: n(eces)ito mi +//.
 %flu: [RV/A]
 *CHI: <donde esta > [/] donde voy a llevar mi cinturon en mi tractor?
 %flu: [RV/A]
 *FAT: ah [^ makes clicking sound like fastening a seatbelt].
 *FAT: ahora señor.
 *FAT: pero un poco mas fuerte señor tractor.
 *CHI: ay@e mi [/] mi [/] mi xx de tractor &se &=imit:tractor !
 %flu: [SWR]x2
 %flu: [RV/A]

%exp: goes back to kitchen to park the tractor.
*FAT: ok, ya esta xx el tractor estacionado y todo en orden?
*CHI: 0 &=nod .
*CHI: espera papi.
*FAT: que gordo?
*CHI: xx ## cookies.
*FAT: cookies?
*CHI: xxx asi [^ holds up fingers to indicate a square cookie].
*FAT: vale, solo porque mami no esta y hoy vamos a hacer un día vago y todo.
*CHI: asi [/], asi cookie.
*FAT: ok, bueno cambio cookie por beso.
*CHI: [^ running to kitchen] <xxx un> [/] <no hay un cookie> [/] no esta
abierto.
%flu: [RV/A]
%flu: [RV/A]
@End