THE ROLE OF INPUT STATISTICS IN ACQUISITION: AN INVESTIGATION OF PHONOLOGICAL DEVELOPMENT IN TWINS

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THE ROLE OF INPUT STATISTICS IN ACQUISITION: AN INVESTIGATION OF PHONOLOGICAL DEVELOPMENT IN TWINS

by

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ABSTRACT

In this thesis, I address the general question as to whether frequency of the input in the ambient language can determine the order of acquisition in phonological productions. This issue is addressed through an investigation of two corpora of phonological development in twins. I hypothesize that the environment should prevent at least some degree of variation between members of each of the twin pairs and, possibly, eliminate some of the variation typically observed across non-twin learners. To test this hypothesis, I analyse the development of word-initial branching onsets and sC clusters. The results show variation within and across twin pairs. To determine whether frequency influences the orders of acquisition attested, I consider frequency on three levels: individual clusters, cluster types and onset structures. The results show that only at the level of onset structure does frequency correlate with the order of acquisition. This suggests that frequency cannot be taken as a strong predictor for phonological development.

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Chapter 1

INTRODUCTION

1.1 Introduction

Studies focusing on early phonological development provide robust evidence that variation exists across language learners, both within and across languages. During the period in which a child acquires his/her first 50 words, individual differences emerge (e.g. Leonard, Mesalam and Newhoff 1980). Variation also exists in the order in which the acquisition process unfolds. Despite the variation encountered, acquisitionists of the 1970's and 1980's have devoted efforts toward finding either a universal order of acquisition or universal linguistic operations applicable to particular stages of language development (Leonard et al. 1980).

In this thesis I propose to look at the issue of individual variation between learners in a virtually controlled environment. In order to do so, I will study the acquisition of language in twins. Indeed, the twinning situation comes closest to offering the right context to undertake such a study. As opposed to any other non-twin language learners, twins typically share a quasi-identical linguistic environment throughout early language development.

It is widely observed that language learners acquire the structures of their phonological systems in a given order. Proponents of models based on statistical learning argue that the order of acquisition is driven by statistical tendencies observed in the target language. Specifically, the more frequent a structure, the earlier it is predicted to be

acquired. However, variation is well-attested between learners of a single language. Consequently, the sources of the learning paths and of variation observed between learners are not clearly understood. Indeed, as argued by Goad and Ingram (1987), variation between first language learners exists even after performance and environmental factors have been eliminated.

To date, with the exception of Leonard et al. (1980), most studies addressing variation have been comparing data from several children who have *similar* linguistic backgrounds. Similar backgrounds imply that the children are acquiring the same language or language dialect, and come from similar social backgrounds. Under these circumstances, it is assumed that the children have access to equivalent linguistic input. However, to determine whether variation occurs in first language learners who have access to a virtually identical input, a longitudinal study of twins is what comes closest to ideal. This is the model environment since twins are most likely to receive linguistic inputs that are nearly identical. It is from this perspective that I plan to test predictions made by statistical models of child language production such as the one proposed by Levelt, Schiller and Levelt (1999/2000).

Following Levelt et al., I hypothesize that the order of acquisition mirrors the frequency of the input. I address this issue by comparing the frequency of the input to the orders of acquisition attested by the children in both corpora on three levels: individual clusters (e.g. [pl] versus [st]), cluster types (e.g. obstruent+lateral versus [s]+obstruent) and syllable structures (e.g. branching onsets versus sC clusters). Still following Levelt et

al., in cases where variation emerges, I predict the units showing variable orders of acquisition to display similar frequencies in the input.

As we will see, the results show that the orders of acquisition that emerges for each child varies in comparison to their sibling. When the order of acquisition of individual clusters is compared to the relative frequency of clusters, no correlations suggesting frequency as a source for variation can be made. Likewise, when the same comparisons are made between cluster types and frequency, the hypothesis that acquisition is frequency-driven is again not supported. However, when the order of acquisition of syllable structures are compared to the frequency of the input of these structures, the results suggest that frequency motivates the order of development. Similar results are presented by Lleó and Demuth (1999), Roark and Demuth (2000), Demuth and Johnson (2003), Stites, Demuth and Kirk (2004), and Kirk and Demuth (2005). For example, Demuth and Johnson (2003) argue that the high number of words truncated to CV forms produced by a young learner of French correlate with the high frequency of this syllable type in French. In contrast to this, English learners tend to produce more CVC forms, again in line with relative prominence, that of CVC syllables in English. While these studies focus primarily on variation across learners of different languages, this study strictly considers individual variation in the course of acquisition of a single language, English. I will conclude from the variation observed in the current study that environmental factors such as frequency may play a general predictive role, but that frequency does not seem to be determining precise details of the developmental paths.

The primary focus of this thesis is on variation in learning paths, with a secondary interest the rate of acquisition.

1.2 Thesis Overview

This thesis is organized as follows. In Chapter 2, I discuss studies which provide evidence for variation in language development, as well as a survey of the literature on language development in twins. In Chapter 3, I present my methodology and the corpora under investigation. The results of my study are presented and discussed in Chapter 4. The results provide evidence for variation in the order of acquisition of development in all four children. Chapter 5 compares the order of acquisition attested for each child to relative frequencies for individual clusters, cluster types and syllable structures. The results suggest that only the order of acquisition of syllable structures is influenced by the frequency of the input. A summary of the results and general conclusions emerging from these results are presented in Chapter 6. Accompanying these conclusions are suggestions of methods for improving future studies

In the following chapter, I turn to a survey of the background literature discussing current debates on the possible sources for variation in language development.

Chapter 2

BACKGROUND LITERATURE

2.1 Introduction

In this chapter, I discuss examples of variation found in previous studies on language development. A survey of studies documenting variation is offered in section 2.2. Of the sources that are deemed potentially responsible for the variation observed, environmental factors, especially the linguistic environment within which acquisition generally takes place, are reviewed in section 2.3. I focus mainly on frequency effects in section 2.4, which is also considered a source for variation in the literature. While discussing frequency effects, I pay particular attention to the study conducted by Levelt et al. (1999/2000). In section 2.5, a detailed description of the background literature on twins is provided. (As we will see, most studies of language development in twins have looked at social-discursive development.) Taking the observations discussed throughout this chapter, I formulate research hypotheses and methods of investigation, which I discuss in section 2.6.

2.2 Variation in Language Development

Goad and Ingram (1987) identify three types of individual variation: performance variation, environmental variation and linguistic variation. Performance variation relates to general differences found among children, such as their individual rates of acquisition. Environmental variation is caused by differences found in the linguistic input, for

example in the acquisition of frequently- versus rarely-occurring sounds or sound sequences. Finally, still according to Goad and Ingram, linguistic variation arises from the number of different choices that the language acquisition device (i.e. the child's language learning competence O'Grady (1997)), allows for a particular structure. In the following subsection, I provide examples of variation which illustrate additional potential sources of variation.

2.2.1 Examples of Variation in Language Development

The issue of variation between learners in first language acquisition has been widely discussed in the literature. For example, Leonard et al. (1980) describe variation among 10 children acquiring English, focusing on the first 50 words acquired by the children. Their investigation of the word-initial consonant phone classes displayed by the 10 subjects revealed *no* systematic correspondence among subjects. While some cross-child preferences were observed (for example, voiced consonants seemed to have dominance over voiceless consonants), none of the subjects produced the same phone classes[1]. The possibility that the linguistic environment of the children was playing a crucial role in the shaping of their initial productions was tested in the second experiment conducted by Leonard et al. (1980). I come back to this experiment in section 2.3.1.

A second example of variation in early child language is provided by Rose (2003), who discusses variation in the learning paths of two children learning French

[1] Initial productions of a given word, including variants, are grouped together into the same phone class. For example, if a child's production of *toe* varied from [tʰoʊ] to [doʊ], the variants of this word would be grouped as |tʰ~d| (Leonard et al. 1980). This procedure is from Ferguson and Farewell (1975).

(Clara and Théo) with respect to their acquisition of word-final [ʁ]. Clara acquired word-final [ʁ] later than other word-final consonants, at a stage which coincided with the acquisition of word-medial codas (i.e. branching rhymes). As opposed to this, Théo acquired word-final [ʁ] early, along with all word-final consonants, and well before he acquired branching rhymes. This variation is explained through properties of segmental representations. Rose (2003) proposes that there is a relationship between segmental place of articulation and word-final consonant syllabification: Clara's [ʁ] acts as a placeless consonant, while Théo's [ʁ] behaves as place-specified (Dorsal). The evidence for this variation is derived from analyzing singleton versus branching onsets for both Clara and Théo. Unlike Leonard et al. (1980), Rose (2003) explains the variation from the phonetics of French /ʁ/ and argues that language learners may utilize different types of phonetic evidence to analyze the phonological properties of the target (adult) language.

A third example of variation in language acquisition comes from Levelt et al. (1999/2000), who explain the variation found in their study by considering input frequency as a determining factor. This explanation for variation contradicts the previously-discussed conclusions made by Leonard et al. (1980) and Rose (2003). This study is discussed in greater detail in section 2.4.1.

2.2.2 Section Summary

As can be inferred from the quick survey presented above, the source of variation in early language acquisition has yet to be determined. In the following section, I discuss

environmental factors more in depth. This discussion leads to the issue of frequency, addressed in section 2.4.

2.3 Environmental Factors

Previous studies of language development in twins provide evidence that language delays are often encountered in this population of learners, although this issue appears to be controversial. It is important to note in the context of this thesis that some of these studies imply that at least part of the delays observed in language development in twins may originate from their environment. In addition, certain factors must be taken into consideration when studying the language of twins. For example, Costello (1974) and Conway and Lytton (1975) agree that the characteristics of the speech adults direct towards twins must be taken into account when analyzing the period of time during which the twins are delayed. Conway and Lytton observe that parents of twins speak less to each twin, which results in the reduced verbal capacity of the twins themselves.

In contrast to the above, Tremblay-Leveau, LeClerc and Nadel (1999) do not observe any delay. They conclude from a study comparing twins and aged-matched singleton children that by the end of the second year, twins' language production in a triadic interactive context was not delayed at all. In fact, at the 16-month age mark, there were no distinctions between the twins and singletons. Also, they found that 23-month-old twins' language production exceeded singletons' in term of quality and quantity, the twins producing more than twice as many utterances as singletons, both to the adult and to the co-twin, in both declarative and interrogative formulations. In addition, the twins

learned more quickly than singletons how to use language in dyads within triads to express emotions and desires, and to influence their partner. This is compatible with the observation that a triadic environment is one that twins are most frequently exposed to. The environment in which a child acquires language thus appears to influence production either through enhancing or hindering it.

Note as well that most studies focusing on variation have been comparing data from several children who have *similar* linguistic backgrounds. *Similar* linguistic backgrounds refer to children who have the same target languages and comparable social backgrounds. Therefore, the notion *similar* is, at best, vague. This assumption is directly tested by Leonard et al. (1980), discussed in the following subsection.

2.3.1 Variation Among Twin Pairs

Leonard et al. (1980) investigated the role of the linguistic environment in language acquisition. They conducted tests on a pair of identical twins, in order to control for genetic factors. Their basic assumption was that the twinning context enables what comes closest to a controlled environment, since twins have virtually identical linguistic environments in the period during which language development takes place. Results from these tests were compared with results obtained from the singleton learners in experiment one, previously discussed in section 2.2.1. Transcriptions of word-initial consonants were grouped into phone classes. The results showed that the order and point in time in which shared consonants emerged differed between the twins. Due to the nature and extent of the variability observed in the twins' phone classes, Leonard et al. (1980) concluded that

the phone classes of the twins were not much different from those from the singletons under investigations. These results suggest that the linguistic environment does *not* have a significant impact on the children's respective developmental paths.

Evidence to further support this claim comes from Bruggemann (1970). This research documents two sets of identical twins. Comparing twins within twin pairs, Bruggemann (1970) provides evidence that variation is unique to the children, *not* to the environment. Within each twin pair, Bruggemann found that one twin was more linguistically advanced than the other, which implies that they were not at the same stage in the development of their language. This undermines any hypothesis that establishes a correlation between acquisition paths and environmental factors, at least within a single language.

2.3.2 Section Summary

This section presents several hypotheses pertaining to environmental factors as a source for variation in singleton and twinning situations. Costello (1974), Conway and Lytton (1975) and Renznick (1997) suggest that the adult input is an important consideration. In contrast to this, Tremblay-Leveau et al. (1999) find variation within twin pairs and conclude based on this variation that the environment cannot be a source for variation. Leonard et al. (1999/2000), as well as Bruggemann (1970) also find that the environment of the children cannot fully explain the variation found.

In the following section, I focus on frequency effects, which constitute a specific type of environmental factor that may account for variation in early child acquisition.

2.4 Frequency Effects

With respect to lexical access in speech production, Dell (1990) states words in the mental lexicon either have syntactic representations (lemmas) or phonological representations (lexemes). Discussing the phenomenon of homophony, in which two or more lemmas may share an identical lexeme, Dell (1990) argues that an item's susceptibility to phonological errors is determined not only by its own frequency but by the sum of the frequencies of all of the homophones. This suggests that both low-frequency targets and their high-frequency homophones in the lexicon are projected onto the same phonological representation even though they have distinct lemma representations.

Challenging this conclusion, Caramazza, Costa, Miozzo and Bi (2001) reported a series of experiments that demonstrate that the ease of producing a word depends only on the frequency of that specific word and not on the frequency of a homophone correspondent (see also Jescheniak, Meyer and Levelt 2003 and Jescheniak and Levelt 2004). Caramazza et al. (2001) conclude from this that homophones have separate word form representations and that the absence of frequency-inheritance[2] effects for homophones prevents full support for the lexical model advocated by Dell (1990).

In sum, Dell (1990), Caramazza et al. (2001), Jescheniak and Levelt (1994) and Jescheniak et al. (2003) all find frequency effects in language production, even if they

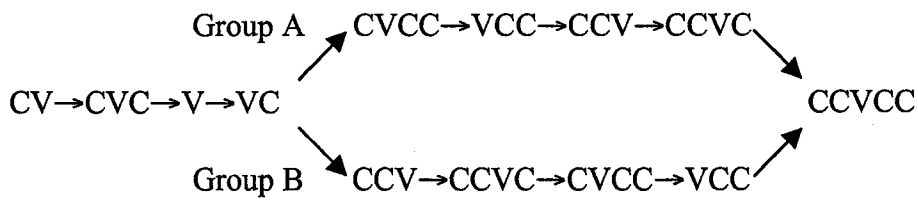
[2] The term *frequency-inheritance effect* refers to the observation that the ease of producing a word is affected by the existence of another word with the same phonological form (Jescheniak et al. 2003).

differ in their interpretation of the effects uncovered by their experiments. Levelt et al. (1999/2000) extend this hypothesis by investigating how frequency affects the acquisition of phonology. Their argument is based on the order of acquisition of syllable types in production. Their findings are discussed in the following subsection.

2.4.1 Levelt et al. (1999/2000)

The literature discussed in the previous section generally shows that frequency does have an influence on the speaker's performance. The current section discusses an example of frequency viewed as a predictor of production patterns in language development, as proposed by Levelt et al. (1999/2000). This study is based on data from a longitudinal corpus documenting 12 children acquiring Dutch as their first language. The study concentrates on primary stressed syllables, excluding syllables with /s/-initial clusters. It is thus based on following syllable types: CV, VC, V, CVC, CCVC, CCV, CVCC, VCC, and CCVCC. These syllable types are considered acquired when produced by the child at least twice during the same recording session. The results are aligned on a Guttman scale, to obtain an acquisition order and to determine to what extent an acquisition order is followed. The results show that the children can be divided into two subgroups (A and B). The variation found between these subgroups is illustrated in Figure 2.1 below.

Figure 2.1 Variation in the acquisition of syllable types in Dutch (Levelt et al. 1999/2000)



Group A acquired coda clusters before onsets clusters, while the children in Group B acquired onsets clusters first, before they acquire coda clusters. Levelt et al. (1999/2000) explain this variation by considering frequencies of syllable types in Dutch. They establish a close correlation between the frequency and the specific developmental order of the syllable types found in the data. High-frequency syllable types are generally acquired before lower-frequency ones. The fact that CCV, CCVC, VCC and CVCC syllables have relatively similar frequencies of occurrence in the language correlates with the variation observed between Groups A and B. Levelt et al. (1999/2000) thus concluded that the frequency information of the input is an important predictor of both development paths and cross-learner variation.

2.4.1.1 Discussion of Levelt et al. (1999/2000)

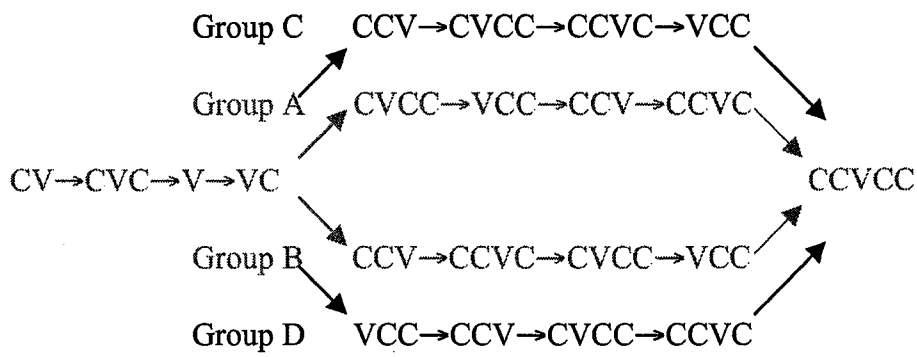
Kehoe and Lleó (2003), who replicated the Levelt et al. (1999/2000) study based on a population of German, Spanish, and bilingual German-Spanish learners, did not, provide fully supporting evidence for a frequency-only explanation of the acquisition paths observed in these learners. They conclude that frequency information may explain some but not all of the development paths observed.

According to Pan and Snyder (2003), while the Guttman scales utilized by Levelt et al. adequately reflect the variation observed in Dutch-learning children, they question whether this ordering reflects the sequence of acquisition. For example, the method employed in the Levelt et al. study prevented detection of a child's production of CVC syllables before the time of the first recording session. In addition, if CVC syllables have a lower frequency than CV syllables in Dutch (and in the child's speech), then the researchers are building frequency effects directly into their results, rather than observing a cognitively-true acquisition order (Pan and Snyder 2003:617). According to these authors, then, the Guttman scales only display the order of the first recorded occurrence of a production.

The fact that Levelt et al. (1999/2000) did not fully account for the first four acquired syllable types was addressed in Pan and Snyder's (2003) reanalysis of Levelt et al.'s (1999/2000) data. They found that the first three syllable types; CVC, V, and VC are acquired together, instead of in a sequence, a conclusion that contradicts Levelt et al. (1999/2000). Pan and Snyder (2003) claim that any variation in the order of acquisition among CVC, V, and VC simply reflects their relative frequency of use, rather than the frequency in the input.

Finally, it is important to notice that only two patterns emerged in the data (illustrated in Figure 2.1), while many more learning paths are possible. Two of the attested patterns are shown as Groups C and D in Figure 2.2.

Figure 2.2 Two additional paths of variation which are predicted but not attested



Any principled approach to development should be able to account for the absence of these unattested developed patterns, all of which are predicted through a frequency-based account.

2.4.2 Section Summary

Variation clearly exists in child language, but the sources of the variation are difficult to determine. Leonard et al. (1980) consider the linguistic environment as a source of variation, but cannot empirically support this hypothesis. Rose (2003) explains the source of variation by considering the types of segmental representations that children can attain from the phonetics of the ambient language. Levelt et al. (1999/2000) consider input frequency as a source for variation. The results discussed in the current section show that the issue of variation in language acquisition must be investigated further, perhaps by investigating each source individually using clear criteria for determining the effect of each potential source of variation. Meanwhile, in the recent literature, one of the leading hypotheses takes input frequency as a crucial factor in early child acquisition

(e.g. Kirk and Demuth 2003 and Demuth and Johnson 2003). This predicts, in line with Levelt et al.'s (1999/2000) hypothesis, that frequent units will be acquired first, while less frequent units will be acquired later. Moreover, units of relatively equal frequency are predicted to be acquired in a variable fashion, but within closely-related acquisition stages.

The remainder of this chapter focuses on language development in twins. These discussions provide background literature on twins, including delays found in twins, and research on their phonological development. The current hypothesis is then formulated in section 2.6, which builds on the leading hypothesis discussed in this chapter.

2.5 Background Literature on Twins

This section provides a survey of the background literature on language acquisition twins. As we will see, this is a relatively small field of study that calls for further research, especially from the perspective of phonological development.

2.5.1 Overview of Studies of Language Development in Twins

Studies on language development in twins have been conducted since at least the mid 1930's. These studies investigated a variety of topics through investigations of Mean Length of Utterance (MLU) (Day 1932, Davis 1937, McEvoy and Dodd 1992), sentence construction (Day 1932, Davis 1937 and Lübbe 1974), the development of speech parts (Day 1932 and Davis 1937), the development of speech articulation (Day 1932 and Zazzo 1960), the use of socialized speech (Day 1932, Keenan 1975 and Waterman and Shatz

1982), the use of egocentric speech (Day 1932, Davis 1937, Zazzo 1960 and Lübbe 1974), autonomous speech (Lübbe 1974, Luria and Yudovich 1959, McEvoy and Dodd 1992 and Dodd and McEvoy 1994), and unintelligible speech (Matheny and Bruggemann 1972). These topics were discussed in relation to factors such as birth order (Day 1932, Davis 1937 and Mittler 1970), gender (Day 1932, Davis 1937 and Zazzo 1960), genetic factors and zygosity (Mittler 1974, Munsinger and Douglass 1976, Rice 1996, Stromswold 1998, 2004, Dionne, Dale, Boivin and Plomin 2003, McGregor and Capone 2004 and Kovas, Hayiou-Thomas, Bishop, Dale and Plomin 2005) and mental disorders (Levy 1997).

2.5.2 Language Delays in Twins

In most of these studies, the twins are reported to be slightly delayed in their early language development. However, the authors did not agree on issues such as the importance of the delays observed or when the delays were resolved during the process of language acquisition. For example, Day (1932) observed that twins lagged behind singletons. She concluded that a twin child at the age of five is at the same level as a three-year-old singleton. She also suggested that the delays observed increase in importance as the twins grow older. In contrast to this, Mittler (1969) argued that four-year-old twins are approximately six months behind singletons. Both Day and Mittler correlate these delays to socioeconomic factors. Another example comes from Dionne et al. (2003) who assessed 1,505 same-sex twin pair cohorts at two years of age and another cohort of 1,049 at three years of age. Results showed that when compared to singletons,

the two-year-old cohort showed a three-month delay, while the three-year-old cohort showed a three-to-four month delay. Dale, Dionne, Eley and Plomin (2000) also suggest that twins develop language two to three months later than singletons. Similarly, Matheny (1973) found that twins were markedly delayed in the development of articulation when compared to singletons. Results found by Arnold and Landau (1980) show that twins have language delays at 18 months but are comparable to singletons by age three. This provides counter-evidence to the conclusions made by Day (1932), stated above, that language delays increase as the child grows older. Finally, offering a meta-analysis based on a large number of studies of language development in twins, Wilson (1977) argued that 44.5% of the twins in his sample scored at least as high as their non-twin siblings on verbal IQ.

In addition to disagreeing on the incidences of language delays in twins, the authors listed above debate the factors responsible for the delays observed, more specifically whether the delays are innate or acquired. On the one hand, researchers such as Luria (1936) and Zazzo (1960) claim that the twin situation yields a special context, namely one in which two children of the same age share the same environment, which is considered detrimental to language acquisition. On the other hand, many studies also investigate the importance of genetic factors in the development of the speech of twins. For example, Luria (1936) proposed that the relationship between genetic and environmental factors must be considered, even if it cannot be constant over the period when the twins are growing up. In contrast, Munsinger and Douglass (1976:49) put forth a much stronger claim: they assess the hereditary capacity for language at around 80%,

and claim that the total environmental influence cannot exceed 10%. The remaining 10% encompasses the parents' misclassification effects on their children's language skills.

Since the issue of genetic influences lies beyond the scope of my thesis, I focus more specifically, in the next section, on phonological development in twins.

2.5.3 Studies of Phonological Development in Twins

Studies of language acquisition in twins from the perspective of phonological development are virtually non-existant. In one of the rare studies, Levy (1997) states that both healthy and brain-injured twins follow a normal developmental course. The data presented by Levy suggest that the notion of complexity in language acquisition needs to be defined. Instead of viewing young children's difficulties as emanating from formal linguistic systems, the data suggests that it is in the semantic and pragmatic aspects that the most pronounced difficulties seem to reside. This implies that environmental effects may not be very prominent for the acquisition of phonology.

In a previous study by McEvoy and Dodd (1992), 19 sets of twins were studied and the results showed that the twins performed more poorly than singleton controls from both syntactic and phonological perspectives. Semantic and pragmatic abilities were also tested; the results did not suggest a delay in the sets of twins. Additionally, while the twins had shorter MLU than the singletons, they performed within the normal range. Furthermore, within each set, the twins shared an atypical phonological process, which was typically not displayed by normally-developing children. For example, they deleted the initial consonant, producing 'oat' for 'boat' (McEvoy and Dodd 1992:84). In a later

study, Dodd and McEvoy (1994) focused on the phonological abilities of 19 sets of twins. Their study provided evidence against 'twin language', i.e. against the development of a special language between twins unique to each twin pair, since the phonologies of the siblings were not identical.

Most of the existing twin studies are based on English-speaking twins. One exception to this comes from Zhu and Dodd (2000) who investigate the phonological systems of a set of Mandarin (Putonghua)-speaking twins. Using quantitative and qualitative measures, they discuss whether twins have two lexical representations for some lexical items or if the Mandarin twins would develop phonologically on the same path as singletons. The two general questions addressed by Zhu and Dodd (2000) are, first, whether the phonological systems of the co-twins display the characteristics of delayed or disordered development and, second, whether the co-twins understand both the adult and their sibling's phonological forms. The phonologies of two twin boys were observed as they participated in a picture-naming task and a single word comprehension task, during child-child interaction and during child-adult interaction. The results show that the twins make more speech errors than singletons of the same age. These errors were not typical of chronological age and were rarely produced by normally developing singletons. However, delayed singletons do produce these errors.

2.5.4 Section Summary

Based on the few phonological studies of twins that exist, the overall generalization appears to be that when the phonological systems within twin sets are

investigated, the results show that the twins are not identical. This corresponds with the range of variation that has been observed across the studies discussed throughout this chapter.

As already mentioned, my thesis has as its central focus variation between twins during language acquisition from the perspective of phonological development. The patterns of development and variation observed will be discussed in light of statistical properties of the general linguistic environment.

The following section discusses my hypothesis, which builds on the literature discussed in this chapter, and provides a brief description of how I plan to test my hypothesis.

2.6 Hypothesis

As discussed earlier in this chapter, Leonard et al. (1980) analyse frequency effects in relation to segment development in twins, while Levelt et al. (1999/2000) analyse frequency effects in relation to prosodic development in a non-twin population. In the current thesis, I analyse prosodic development similarly to Levelt et al. (1999/2000) but using the rigorously controlled environment offered by twinning situations, as did Leonard et al. (1980). Building on the findings from the previous literature on language development in twins, I hypothesize that variation is interpersonal. However, if the results show no variation, this will be taken as supporting evidence for the role of frequency in setting developmental paths in early child language acquisition. To test my hypothesis, I analyze the development of both branching onsets and

[s]+consonant (sC) clusters for two corpora documenting phonological development in twins. I discuss these corpora and the method of analysis in the following chapter.

Chapter 3

METHODOLOGY

3.1 Introduction

To discuss issues such as the ones outlined in the previous chapter, I use, in this thesis, data collected from two sets of twins. Both corpora originate from previous empirical studies. I will refer to them as the Goad corpus and the Cruttenden corpus. Both corpora are described in the following two sections respectively. These corpora provide data for the development of branching onsets and [s]+consonant (sC) clusters for all four children under investigation. The target clusters are described in Section 3.4. The criteria for data inclusion and exclusion are presented in Section 3.5. Section 3.6 introduces the method used to compile and code the data. This is followed by a discussion of some of the specific goals of the current research.

3.2 The Goad Corpus

The first corpus, collected by Dr. Heather Goad of McGill University, who was, at the time, a student at the University of British Columbia, documents the productions of two monozygotic (identical) twin boys, David and Mark (Goad 1984). At the time of the first recording session the boys were 3;3.21. Each child was recorded individually once a month for four months, with the exception of the second session, during which both children were recorded together, and the fourth session, which was recorded two months following the third session. All sessions are limited to approximately one hundred

utterances. Table 3.1 includes the dates of the recording sessions and the age of the child at the time of the session, as well as to the number of utterances recorded from each child in each session.

Table 3.1 Breakdown of the Recording Sessions in the Goad Corpus

Session Date	Age	David's Tokens	Mark's Tokens
1983-09-22	3;3.21	101	103
1983-10-27	3;4.26	52	48
1983-11-27	3;5.26	100	100
1984-01-14	3;7.13	100	100

These utterances were captured using a diary method whereby productions are directly transcribed at the time of recording. I entered the data into *Phon* (Rose, MacWhinney, Byrne, Hedlund, Maddocks, O'Brien and Wareham 2006), a database program designed specifically for the compilation and analysis of child language phonological data. These data have already been used in analyses presented in Goad (1984) and in Ingram and Goad (1988). However, neither of these works discusses the acquisition of branching onsets or sC clusters. My thesis will thus be the first to document this topic using these data.

3.3 The Cruttenden Corpus

Dr. Alan Cruttenden, from the University of Manchester, collected the second corpus, also following a diary methodology with no audio or video recording. This corpus documents dyzygotic (fraternal) twin girls, Jane and Lucy (Cruttenden 1978). I accessed the corpus through the CHILDES website (http://childes.psy.cmu.edu/). At the

time of the first session, the children were at age 1;5.17. The study continued until the twins were 3;7.18. A total of 85 and 86 sessions for Jane and Lucy, respectively, have been documented. Table 3.2 below gives the number of utterances produced by each child in the Cruttenden corpus per session; '---' indicates a session date in which the child does not have utterances recorded.

Table 3.2 Breakdown of the Recording Sessions in the Cruttenden Corpus

Session Date	Age	Number of utterances		Session Date	Age	Number of utterances	
		Jane	Lucy			Jane	Lucy
1968-10-12	1;5.17	7	28	1969-10-19	2;5.24	10	11
1968-10-15	1;5.20	2	---	1969-10-23	2;5.28	6	5
1968-10-16	1;5.21	---	14	1969-10-24	2;5.29	3	---
1968-10-19	1;5.24	3	30	1969-11-02	2;6.8	24	12
1968-10-22	1;5.27	---	20	1969-11-05	2;6.11	---	4
1968-10-23	1;5.28	6	10	1969-11-08	2;6.14	20	21
1968-10-24	1;5.29	4	26	1969-11-13	2;6.19	7	18
1968-10-31	1;6.6	13	5	1969-11-14	2;6.20	2	2
1968-11-02	1;6.8	3	1	1969-11-16	2;6.22	5	---
1968-11-07	1;6.13	14	1	1969-11-19	2;6.25	---	78
1968-11-18	1;6.24	15	41	1969-11-25	2;7.0	12	9
1968-11-29	1;7.4	22	22	1969-12-06	2;7.11	45	31
1968-12-06	1;7.11	12	16	1969-12-18	2;7.23	75	61
1968-12-10	1;7.15	2	12	1969-12-31	2;8.6	13	23
1968-12-20	1;7.25	10	7	1970-01-01	2;8.7	34	52
1968-12-27	1;8.2	15	14	1970-01-02	2;8.8	6	10
1969-01-03	1;8.9	10	7	1970-01-11	2;8.17	14	6
1969-01-11	1;8.17	1	1	1970-01-25	2;9.0	---	5
1969-03-19	1;10.22	10	12	1970-02-01	2;9.7	13	27
1969-03-28	1;11.3	3	2	1970-02-07	2;9.13	1	---
1969-04-07	1;11.13	9	33	1970-02-12	2;9.18	58	49
1969-04-10	1;11.16	49	74	1970-02-14	2;9.20	4	114
1969-04-13	1;11.19	58	101	1970-02-16	2;9.22	16	7
1969-04-22	1;11.28	27	35	1970-02-17	2;9.23	6	---
1969-04-27	2;0.2	5	---	1970-02-28	2;10.3	4	4
1969-04-29	2;0.4	3	11	1970-03-07	2;10.10	24	26
1969-05-03	2;0.8	2	3	1970-03-15	2;10.18	13	26
1969-05-04	2;0.9	12	23	1970-03-23	2;10.26	39	39
1969-05-05	2;0.10	13	19	1970-04-02	2;11.8	10	9
1969-05-11	2;0.16	2	2	1970-04-10	2;11.16	36	10
1969-05-12	2;0.17	3	2	1970-04-25	3;0.0	7	2
1969-05-13	2;0.18	6	14	1970-05-08	3;0.13	---	3

1969-05-24	2;0.29	7	13	1970-05-29	3;1.4	3	1
1969-05-26	2;1.1	18	43	1970-06-16	3;1.22	3	5
1969-06-01	2;1.7	21	19	1970-07-05	3;2.10	22	18
1969-06-05	2;1.11	3	3	1970-08-16	3;3.22	20	4
1969-06-16	2;1.22	33	37	1970-09-08	3;4.14	1	1
1969-06-21	2;1.27	7	4	1970-09-13	3;4.19	---	2
1969-07-02	2;2.7	20	19	1970-09-24	3;4.30	3	8
1969-08-07	2;3.13	34	23	1970-10-10	3;5.15	---	1
1969-08-20	2;3.26	82	75	1970-10-24	3;5.29	---	3
1969-08-30	2;4.5	36	27	1970-11-22	3;6.28	2	7
1969-09-13	2;4.19	24	9	1970-12-05	3;7.10	3	---
1969-09-21	2;4.27	6	30	1970-12-26	3;8.1	3	---
1969-10-04	2;5.9	8	8	1971-01-11	3;8.17	4	---
1969-10-07	2;5.12	29	17	1971-02-27	3;10.2	---	2
1969-10-10	2;5.15	34	31	1971-02-28	3;10.3	2	---
1969-10-17	2;5.22	27	18				

I formatted and imported the original transcriptions of the Cruttenden corpus into *Phon. Phon* was used to identify each of the target structures from each of the four children. These target structures are presented in the following section.

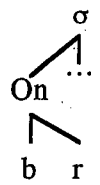
3.4 Target Structures Under Investigation

The current research focuses on the development of word-initial branching onsets and sC clusters within morphologically simple words. Only underived words have been chosen, in order to avoid any issues that may arise from the acquisition of morphology or from potential morpheme boundary effects. Both of these onset structures are discussed in the following two subsections. Examples from the data are presented for each onset structure.

3.4.1 Branching Onsets

According to Kaye, Lowenstamm and Vergnaud (1990), the adult inputs of branching onsets are illustrated as follows.

Figure 3.1 Structure of a branching onset



Branching onsets are onset clusters containing an obstruent followed by a sonorant continuant. The branching onsets under investigation in my thesis include obstruent+lateral and obstruent+rhotic clusters. Examples of these cluster types are provided in Table 3.3.

Table 3.3 Examples of Branching Onsets[3]

Cluster	**Name**	**Orthography**	**IPA Target**	**IPA Actual**
obs + lat	David	that is a <u>bl</u>ack cat	ˈðætˈɪzəˈ<u>bl</u>ækˈkæt	dætɪsə<u>bl</u>ækkæt
obs + rho	Mark	he <u>br</u>inging tiger up	ˈhiːˈ<u>bɹ</u>ɪŋŋˈtaɪgəɹˈʌp	ʔiˌ<u>bɹ</u>ɪŋgɪŋˈtaɪgəɹʌp

In the following section, I introduce the types of sC clusters that will be the focus of my investigation.

[3] Column labels are provided for this data table only; the cluster in question is underlined. This presentation strategy applies in all relevant contexts in subsequent tables.

3.4.2 sC Clusters

In this thesis, sC clusters refer to all word-initial clusters that begin with the strident consonant [s] followed by a consonant. The sC clusters analyzed in my thesis include [s]+glide, [s]+lateral, [s]+nasal and [s]+obstruent clusters.[4] Following Levin (1985), I assume that the syllable structure involved in these clusters contain an appendix position followed by a singleton onset. In line with Goad and Rose (2004), I assume that this holds true no matter whether the cluster presents a rising or a falling sonority profile between the two consonants, as presented below in Figure 3.2a and 3.2b.

Figure 3.2 Adult inputs of sC clusters

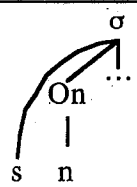
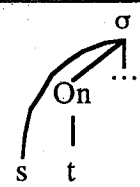
a) Rising sonority	b) Falling sonority
	

Table 3.4 provides examples of these cluster types. Note that there are no [s]+rhotic clusters in the native vocabulary of English (see Rice 1992 and Goad and Rose 2004 for further discussion of onset clusters in this language).

[4] [s]+glide and [s]+lateral clusters can also be classified as obstruent+liquid clusters, or clusters with branching onset structure. For the purpose of this thesis they will however be analyzed as [s]+glide and [s]+lateral clusters, in order to account for their behavior, which often contrasts with that of other obstruent+liquid clusters (see, e.g. Goad and Rose, 2004 for a survey of the literature on this topic).

Table 3.4 Examples of sC Clusters

[s] + gli	Mark	see it goes on my sweater	ˈsiːˈɪtˈgoʊzˈɑnˈmaɪ ˈswɛtəɹ	siɪtgozɑnmaɪ swædəɹ
[s] + lat	Jane	baby to sleep	ˈbeɪbiːˈtuːˈsliːp	beɪbi tə sliːp
[s] + nas	Jane	can smack you again	ˈkænˈsmækˈjuːəˈgɛn	kæn [*] smæk u əgɛn
[s] + obs	David	little spoon	ˈlɪtəlˈspuːn	lɪtspun

Using *Phon*, I extracted all of the branching onsets and sC clusters from both corpora. The results extracted with Phon were then compiled and analyzed. The method of compilation is discussed in section 3.6. Before I address this issue in more detail, I discuss, in Section 3.5, the criteria for inclusion and exclusion of data.

3.5 Data Inclusion and Exclusion Criteria

As mentioned above, only word-initial consonant clusters are discussed in this thesis. Clusters that appear in other positions, i.e. word-medial and word-final, have been excluded from the analysis, as well as clusters that occur at morphological boundaries. Exclusion of these clusters is based on a number of considerations. First, due to the limited size of the corpora (especially, the Goad corpus), the non-initial clusters we not found in sufficient numbers to enable a systematic assessment of their patterning. Second, elimination of clusters that occur at morphological boundaries also eliminates a series of problematic issues. For example, this enabled us to avoid complications related to how these clusters are syllabified. Also, in the particular case of word-final clusters, because such clusters may be formed through morphological operations, for example in the word

closed, ['klouzd], it is impossible to determine whether reductions of this cluster, for example through deletion of the final consonant, originates from a phonological problem or from a lack of acquisition of word-final verbal inflection.

Word-initial clusters containing more than two consonants have also been eliminated from the analysis. For example, [skr] in *screws* could in theory be analysed as a combination to an [s]+obstruent cluster ([sk]) and an obstruent+rhotic cluster ([kr]). However, the evidence suggests that the situation is not that simple. Indeed, the sub-portions of the clusters containing more than two consonants actually do not pattern the same as clusters that have two consonants. Moreover, because of the limited number of attempts at these clusters, there is insufficient evidence to provide a reliable interpretation of the data.

In the following section, I discuss the method of data compilation used for the current study.

3.6 Data Compilation

Upon completion of searches within *Phon*, the data were compiled on spreadsheets using *NeoOffice* 1.2. Five different codes were used to characterize the data. These are illustrated using the word *blue* in the Table 3.5

Table 3.5 Examples of Each Type of Realization for the Word *blue* ['blu:]

Actual Cluster	**Code**	**Description**
a) 'blu:	Target-Like	Target-like production
b) 'plu:	Target-Like	Modification of the first consonant, Target-like
c) 'bwu:	Target-Like	Modification of the second consonant, Target-like
d) 'lu:	C_1 Deletion	Deletion of the first target consonant
e) 'bu:	C_2 Deletion	Deletion of the second target consonant
f) 'u:	Complete Deletion	Deletion of both target consonants
g) 'yu:	Fusion	Consonant output is not identical to either of the input consonants, but contains elements of both

In the table above, (a) through (c) illustrate clusters which are coded as target-like. As can be seen from the examples, the primary constraint is whether a target cluster is produced with both consonants irrespective of whether the consonants undergo modifications in their surface realizations. Example (d) shows a cluster that has undergone C_1 deletion, while example (e) shows C_2 deletion. Of the two remaining examples presented above, example (f) is of a cluster that has both of its consonants deleted. Finally, example (g) illustrates the process of fusion, when the consonant produced retains properties of both of the consonants in the target cluster. An exhaustive list of the data compiled using this method is provided in Appendix A.

The results provided from the searches made using *Phon* are analyzed independently for each child. The children's respective behaviours are subsequently compared within each twin set, from the perspective of the development of each cluster type across time.

Since there is no access to the original audio or video recordings of these data, the transcriptions cannot be verified. I acknowledge that this constitutes a limitation to my study. However, because my investigation focuses primarily on the presence versus absence of segments within onset clusters, the data are well suited for this study. Arguments supporting this claim can be found in studies such as Ingram (1989), Pater (1996, 1997), Rose (2000) and Inkelas and Rose (2006).

The following chapter provides a detailed description of the data compilation for the Goad corpus and the Cruttenden corpus.

Chapter 4

DATA COMPILATION

4.1 Introduction

This chapter provides a detailed description of the acquisition of word-initial branching onsets and [s]+consonant (sC) clusters for both corpora under investigation. In order to provide a general idea of the relative importance of each onset structure considered in this chapter, I provide in Table 4.1 the total numbers of target forms attempted by all four children.

Table 4.1 Summary of Attempted Forms for Each Child

		Goad Corpus		Cruttenden Corpus	
Cluster Type		David	Mark	Jane	Lucy
Branching Onsets	obs+lat	16	13	52	72
	obs+rho	9	14	80	105
sC Clusters	s+gli	0	1	15	14
	s+lat	4	1	6	22
	s+nas	1	1	8	8
	s+obs	5	10	36	39

Given these numbers, which are rather low in some of the categories of clusters, especially in the Goad corpus, conclusive results could be attained only for a subset of the data.

In the following sections, the developmental path for each child is presented separately. For example, in the Goad corpus, the results for David's clusters are presented first, followed by the results found from Mark's. Similarly, in the Cruttenden corpus, the

results for Jane are presented first, followed by those for Lucy. Comparisons are then performed within twin pairs. The Goad corpus is discussed in section 4.2, followed by the Cruttenden corpus in section 4.3. Within each corpus, the acquisition of branching onsets and sC clusters are discussed in turn. Whenever relevant, these cluster types are further divided into specific clusters as outlined in Table 4.1 above. In addition to a quantitative analysis, representative forms are provided throughout the chapter, to illustrate the production patterns from a qualitative perspective. Exhaustive lists are also provided in Appendix A, at the end of the thesis. Following the data compilation for each structure, a brief discussion comparing the siblings is presented. Section 4.4 provides a summary of acquisition paths per twin pair accompanied by a timeline that illustrates each child's order of cluster acquisition. In section 4.5, I offer a general discussion, based on a timeline illustrating the children's learning paths.

4.2 Goad Corpus Data Compilation

In this section, I present the data found in the Goad corpus. I discuss branching onsets in 4.2.1 and sC clusters in 4.2.2. Each of these subsections is divided into two further subsections focusing on David and Mark's productions, respectively.

4.2.1 Acquisition of Branching Onsets

The acquisition of branching onsets encompasses both the acquisition of obstruent+lateral clusters and obstruent+rhotic clusters. I address the development of these two types of branching onsets in turn.

4.2.1.1 David's Development of Obstruent+Lateral Clusters

David attempts 16 word-initial obstruent+lateral clusters. Of these 16 attempts, the first five recorded productions are produced at 3;3.21. Three of these productions are listed in Table 4.2 below.

Table 4.2 David's Obstruent+Lateral Cluster Attempts: C_2 Deletion[5]

Orthography	IPA Target	IPA Actual	Age
clothes	ˈkloʊðz	ˈgoz	3;3.21
clothes	ˈkloʊðz	ˈkozɪ	3;3.21
play	ˈpleɪ	ˌbej	3;3.21

As shown in Table 4.2, the second consonant in the cluster has been deleted in all attempts. This process will be referred to as C_2 deletion for the remainder of this chapter. This process, observed in David's corpus only at 3;3.21, is representative of Stage 1 in his development of obstruent+lateral onsets.

At 3;4.26, David did not attempt any obstruent+lateral clusters. However, at 3;5.26, target-like productions are found in the majority of the cases documented. Of the seven attempts in this session, only two display C_2 deletion. These reductions come from the words *play* ['pleɪ] and *clock* ['klɑk], which were produced as [be] and [kɑk]. The five remaining examples during this stage are produced as target-like. A subset of these productions is exemplified in Table 4.3.

[5] Column labels are provided for this data table only; the subsequent tables all follow the same data presentation order.

Table 4.3 David's Obstruent+Lateral Cluster Productions: Target-Like

played	ˈpleɪd	pled	3;5.26
play	ˈpleɪ	ple	3;5.26
play	ˈpleɪ	ple	3;5.26

Even though the target-like productions in this session all originate from a single morpheme, *play*, I hypothesize that this situation is due to the limited corpus size and that despite some variation in his productions at age 3;5.26, David has reached the mastery stage for obstruent+lateral clusters. This hypothesis is confirmed by the data in Table 4.4 below, in which David's four attempts at obstruent+lateral clusters are all successful in the session following 3;5.26.

Table 4.4 David's Obstruent+Lateral Cluster Productions: Target-Like

black	ˈblæk	blæk	3;7.13
black	ˈblæk	blæk	3;7.13
close	ˈkloʊs	kloz	3;7.13
black	ˈblæk	blæk	3;7.13

In the following section, I discuss the development of obstruent+lateral clusters in Mark's productions.

4.2.1.2 Mark's Development of Obstruent+Lateral Clusters

Mark attempts a total of 13 obstruent+lateral clusters between 3;3.21 and 3;7.13. From 3;3.21 to 3;4.26, Mark is at his first stage of acquisition for these word-initial

clusters. During this stage, similar to David, obstruent+lateral clusters undergo C_2 deletion. Three attempts are made, all of which are listed in Table 4.5.

Table 4.5 Mark's Obstruent+Lateral Cluster Attempts: C_2 Deletion

clothes	ˈklouðz	k^hoz	3;3.21
closed	ˈklouzd	k^hozd	3;3.21
closed	ˈklouzd	kozd	3;4.26

At 3;5.26, Mark's first target-like productions emerge. Six attempts are made in total, four of which undergo C_2 deletion while the remaining two are target-like. These examples are presented in Table 4.6a and b, respectively.

Table 4.6 Mark's Obstruent+Lateral Cluster Attempts
a) C_2 Deletion

playing	ˈpleɪŋ	bɛŋ	3;5.26
closed	ˈklouzd	kozd	3;5.26
blue	ˈbluː	bu	3;5.26
play	ˈpleɪ	be	3;5.26

b) Target-Like

place	ˈpleɪs	ples	3;5.26
place	ˈpleɪs	ples	3;5.26

As illustrated above, target-like productions of obstruent+lateral clusters are beginning to surface at 3:5.26. Because both C_2 deletion and target-like productions are found during this session, and because no systematic documentation is available for an initial stage during which all clusters underwent consonant deletion, I posit that the inter-stage

observed here represents a step forward from the initial stage. I thus interpret the data from this session as representative of an inter-stage, during which the child is starting to produce target-like clusters but has yet to gain a better control on these clusters.

By 3;7.13, Mark has unquestionably gained this control and produces only target-like clusters in four out of the 13 attempts recorded in the corpus. This mastery stage of obstruent+lateral cluster productions is illustrated in Table 4.7.

Table 4.7 Mark's Obstruent+Lateral Cluster Productions: Target-Like

closed	ˈkloʊzd	klozd	3;7.13
closed	ˈkloʊzd	klozd	3;7.13
please	ˈpliːz	pliz	3;7.13
climb	ˈklaɪm	klɑɪm	3;7.13

In the following subsections, I turn to the acquisition of obstruent+rhotic clusters.

4.2.1.3 David's Development of Obstruent+Rhotic Clusters

David attempts nine obstruent+rhotic clusters. His word-initial clusters undergo C_1 deletion, then C_2 deletion, before target-like productions are produced consistently. At 3;3.21, five attempts are made. First, David attempts *press* [ˈpɹɛs], which undergoes C_1 deletion and is pronounced as [wəs]. I address whether this process is fusion below. Two more attempts are made, both of which undergo C_2 deletion. These cases come from the words *from* [ˈfɹʌm] and *dry* [ˈdɹaɪ], which are pronounced as [fʌm] and [dɑɪ]. The two remaining productions in this session are of *broke* [ˈbɹoʊk] and *broken* [ˈbɹoʊkən], which

display target-like clusters, [bɹʌk] and [bwokɛn]. Approximately one month later, at 3;4.26, two more attempts are made. Both attempts at *drawing* ['dɹɒɪŋ] undergo C_2 deletion and are pronounced as [daɪŋ]. At 3;5.26, *present* ['pɹɛzənt] is produced as [wɛsənt] as it undergoes C_1 deletion. Based on these observations, I propose that the period between 3;3.21 to 3;5.26 consists of an inter-stage, since cluster productions during this period can undergo C_1 deletion, C_2 deletion or be realized as target-like. In line with the reasoning proposed above for the incomplete attestation of the initial stage when all clusters typically undergo deletion of a consonant, I label this inter-stage Stage 2.

At 3;7.13, one target-like production of *try* ['tɹaɪ] is attained. Even though this cannot be verified conclusively, due to a lack of data, I hypothesize that this marks the beginning of the mastery stage; Stage 3 in David's development.

The only two examples that undergo C_1 deletion in the data presented above are of *press* and *present*. These are the only cases in which [pr] has been attempted in David's corpus. These data are thus suggestive of a peculiar production pattern (C_1 deletion as opposed to C_2 deletion) that occurs only with [pr] branching onsets. One could explain such a pattern through the fact that both [p] and [w] (David's surface realization for target [r], as illustrated in Table 4.8) are labial, which triggers some type of segment fusion (coalescence).

Table 4.8 David's Production of [r] → [w]

broken	ˈbɹoʊkən	bwokɛn	3;3.21
rain	ˈɹeɪn	wen	3;5.26
resting	ˈɹɛstɪŋ	westɪŋ	3;5.26

However, a fusion analysis would fail in this context because of the fact that it cannot extend to [br] clusters (cf. first example in Table 4.8 above). This suggests that [p] is in some way weaker than [b] when followed by a labial approximant, which in turn supports the idea that that the [pr] cluster attempts above have in fact undergone C_1 deletion, as opposed to fusion. The issue of the relation between this process and voicing is however left for further research.

In the following section, I discuss the development of Mark's obstruent+rhotic branching onsets.

4.2.1.4 Mark's Development of Obstruent+Rhotic Clusters

14 attempts to produce obstruent+rhotic clusters were made by Mark. Of these, 12 are realized as target-like. Representative examples of such productions are presented in Table 4.9. Note that no obstruent+rhotic clusters were attempted at 3;4.26.

Table 4.9 Marks's Obstruent+Rhotic Cluster Productions: Target-Like

broke	ˈbɹoʊk	bɹʌk	3;3.21
bringing	ˈbɹɪŋɪŋ	bɹɪŋgɪŋ	3;3.21
drawer	ˈdɹɒɹ	dɹo	3;7.13

The remaining two clusters attempts are found in Table 4.10. Both of these display deletion of the second consonant.

Table 4.10 Mark's Obstruent+Rhotic Cluster Attempts: C_2 Deletion

brown	ˈbɹaʊn	ˈdaʊ̯n	3;3.21
drawer	ˈdɹɒɹ	doɹ	3;7.13

Because only two clusters out of 15 undergo C_2 deletion, I conclude that by 3;3.21 Mark had already acquired word-initial obstruent+rhotic clusters. This is further supported by the fact that both of these clusters ([br] and [dr]) were in fact successfully produced in other attempts at 3;3.21 (Table 4.9), which suggests that the reduction examples are not representative of the child's grammar at that age.

4.2.1.5 Summary of Development of Branching Onsets

Both David and Mark follow the same order of acquisition for branching onsets. Initially, the clusters undergo C_2 deletion, followed by an inter-stage, which precedes the mastery stage. The first stage in development for obstruent+lateral clusters occurs from 3;3.21 to 3;4.26 for both children. This is followed by an inter-stage at 3;5.26. Both boys are producing target-like obstruent+lateral clusters at 3;7.13. Concerning obstruent+rhotic clusters, Mark produces target-like productions consistently at 3;3.21. On the other hand, David's clusters are not target-like until 3;7.13, almost four months later than Mark's. These data thus suggest that Mark has acquired obstruent+rhotic clusters before David. These data are summarized in Table 4.34.

In the following section, I turn the focus to the acquisition of sC clusters.

4.2.2. Acquisition of sC Clusters

As mentioned above, the sC clusters under investigation in my thesis include [s]+glide, [s]+lateral, [s]+nasal, and [s]+obstruent clusters. Due to the limited number of attempts made by the children from the Goad corpus, these clusters have been grouped into two categories, rising-sonority sC clusters ([s]+glide, [s]+lateral, [s]+nasal) and falling-sonority sC clusters ([s]+obstruent). Each of these cluster types is discussed in detail throughout the following subsections, beginning with David's productions again here.

4.2.2.1 David's Development of Rising-Sonority sC Clusters

David attempts four [s]+lateral clusters and one [s]+nasal cluster. The four [s]+lateral attempts occur at 3;7.13. At this time, two clusters undergo C_1 deletion, both in the word *sleep* ['sliːp], which is produced as [liːp]. Two more attempts are made, for the words *slide* ['slaɪd] and *slippers* ['slɪpəɪz]. *Slide* undergoes C_2 deletion, producing [saɪd], while *slippers* is realized as target-like, [slɪpəɪz]. From these four attempts made by David, I conclude that by 3;7.13, he is at an inter-stage in development.

The one [s]+nasal attempt made by David, of the word *smiled* ['smaɪld], is realized as [maɪjʊd]. This process of C_1 deletion, attested at 3;5.26, is in line with the data on [s]+lateral clusters.

In the following section, I discuss the development of Mark's rising-sonority clusters.

4.2.2.2 Mark's Development of Rising-Sonority sC Clusters

Only three attempts at rising-sonority sC clusters are documented for Mark, one for each cluster type ([s]+glide, [s]+lateral and [s]+nasal). At 3;7.13, Mark's [s]+glide production of the word *sweater* ['swɛtəɹ] is target-like, produced as [swædəɹ]. As well, at 3;7.13 his [s]+lateral production of *slippers* ['slɪpəɹz] is target-like, [zlɪpəɹ]. This suggests that his [s]+glide and [s]+lateral clusters were acquired at that time. The remaining rising-sonority cluster, [s]+nasal, undergoes C_2 deletion at 3;3.21. This example comes from the word *snails* ['sneɪlz], which is produced as ['z̥e̞o̞z̥] by Mark. From the results presented in this subsection and in the previous, these data are inconclusive. However, one claim can be made: Mark is ahead of David in the development of his rising-sonority sC clusters. This is further discussed in section 4.5.

In the following section, I present the data on David and Mark's [s]+obstruent clusters.

4.2.2.3 David's Development of Falling-Sonority sC Clusters

David's attempts at word-initial [s]+obstruent clusters occur between 3;5.26 and 3;7.15. At 3;5.26, David's first attempt at *scaredy* ['skɛɹdi:] is produced as [hɛɹi], a reduction process thus far unattested in his outputs. In the following session, at 3;7.13,

three further attempts of the word *scaredy* are made. These are illustrated in Table 4.11 below.

Table 4.11 David's [s]+Obstruent Cluster Attempts: C_1 Deletion

scared	ˈskɛɹd	qiɹd	3;7.13
scared	ˈskɛɹd	kiɹ	3;7.13
scardy	ˈskɛɹdi	giɹ	3;7.13

All examples in the table above undergo C_1 deletion. The two remaining attempts of the [s]+obstruent cluster, *spoon* [ˈspuːn] and *special* [ˈspɛʃəl], which occur at 3;5.26 and 3;7.13, respectively, were both target-like ([spun] and [spætɪk]). This suggests that David is at the mastery stage at 3;5.26 for [sp], meaning that the syllable structure required to produce [s]+obstruent clusters was acquired by that age.

If the above hypothesis is true, then one needs to explain why [sk] clusters still undergo reduction at that stage. A possible explanation comes from articulatory facts that may affect the production of clusters. From an articulatory perspective, [sk] involves two articulators, which are both reached with a single organ (the tongue). As opposed to this, [sp] also involves two articulators, which however relate to two independent organs, namely the tongue and the lips. According to Inkelas and Rose (2003) and Rose and dos Santos (to appear), contrasts between consonants articulated with the tongue may be difficult to attain, because of factors such as the immature shape of the vocal tract of children (Crelin 1987) and the imperfect motor control that characterizes child speech (Goodell and Studdert-Kennedy 1993).

For example, Rose and dos Santos (to appear) introduce data from Marilyn, a child acquiring French, who can only produce coronal and velar consonants independently, but never within the same word. Representative examples of this asymmetry are listed below.

Table 4.12 Marilyn's Coronal and Dorsal Productions (Rose and dos Santos, to appear)

Articulator	**Orthography**	**Target IPA**	**Actual IPA**	**Gloss**	**Age**
Coronal	tout	tu	tu	all	1;11.13
Dorsal	corps	kɔʁ	kɔ:	body	2;00.25
Dorsal+Coronal	gateau	gato	kako	cake	1;11.13
Dorsal+Coronal	cadeau	kado	kako	present	1;11.28

These examples demonstrate the fact that Marilyn can produce both coronal and velar consonants when these are the only lingual consonants in the word. However, when both a coronal and a velar consonant occur within the same word, no articulatory distinction is produced and the form surfaces as velar-harmonized. From this observation, Rose and dos Santos (to appear) propose that an articulatory sequence with multiple lingual articulations is more difficult to produce for a child than a sequence with repeated articulators (see, also, Pater 1996, 1997) or physiologically independent articulators. This hypothesis is supported by the data from David's [sp] versus [sk] clusters. While David has no apparent difficulty producing a cluster involving two independent organs of articulation ([sp]), he cannot perform the same with clusters whose consonants share the same organ.

Taking the above into consideration, I thus conclude that David has mastered [s]+obstruent clusters at age 3;5.26, despite difficulties in phonetically realizing all

occurrences of such clusters, namely those requiring two independent articulations realized by the tongue.

Mark attempts at [s]+obstruent clusters are discussed in the following subsection.

4.2.2.4 Mark's Development of Falling-Sonority sC Clusters

Mark attempts 10 word-initial [s]+obstruent clusters, all of which are realized as target-like. No attempts are made during the first session at 3;3.21. A subset of these productions is presented in Table 4.13.

Table 4.13 Mark's [s]+Obstruent Cluster Productions: Target-Like

scary	ˈskɛɹ	ske	3;4.26
screws	ˈskɹuːz	skuz	3;5.26
stop	ˈstɑp	stɑp	3;7.13

From the data presented in this subsection and in the previous subsection, it appears that for [s]+obstruent clusters, Mark has acquired these clusters at least one month before David.

4.2.2.6 Summary of Development of sC Clusters

As discussed in the sections on David and Mark's development of rising-sonority sC clusters, the results are inconclusive. I proposed in section 4.2.2.2, that Mark is ahead of David. This suggestion is speculative, however.

Each child attempts [s]+obstruent clusters more frequently than the rising-sonority cluster structures. The data for David suggest that these clusters are acquired at

3;5.26 despite independent issues which, I hypothesized, relate to articulatory factors. On the other hand, Mark has acquired sC clusters by 3;4.26, approximately one month before David, and does not seem to be affected by articulatory considerations.

Overall, based on the limited data for sC clusters, it appears that Mark's acquisition is ahead of David's for both branching onsets and sC clusters. These data are summarized in Table 4.34. In the following section, the results from the Goad corpus are summarized.

4.2.3 Goad Corpus Summary

By comparing the attempts made by each child in the Goad corpus, it can be concluded that the acquisition paths for the twins are similar; however the times in which the children pass through the stages do vary. A comparison of the acquisition of branching onsets reveals David is faster than Mark at attaining the mastery stage of obstruent+lateral clusters by two months, while Mark acquired obstruent+rhotic clusters four months prior to David. Similarly, Mark acquired [s]+obstruent clusters one month before David.

4.3 Cruttenden Corpus Data Compilation

This section presents the results from the Cruttenden corpus. Similar to section 4.2, this section is subdivided into branching onsets, in section 4.3.1, followed by sC clusters, in section 4.3.2. All subsections include a description of Jane and Lucy's productions separately.

4.3.1 Acquisition of Branching Onsets

As previously discussed, branching onsets include obstruent+lateral clusters and obstruent+rhotic clusters. These are discussed in sections 4.3.1.1 through 4.3.1.4.

4.3.1.1 Jane's Development of Obstruent+Lateral Clusters

Jane attempts a total of 52 obstruent+lateral clusters. From 1;5.29 to 2;7.11, Jane is at Stage 1 of her acquisition of obstruent+lateral clusters. During this stage, Jane attempts 21 such clusters. Out of these, 20 undergo C_2 deletion. Three examples of this type of reduction are provides below in Table 4.14.

Table 4.14 Jane's Obstruent+Lateral Cluster Attempts: C_2 Deletion

please	ˈpliːz	p^hii	1;8.2
climb	ˈklaɪm	kaɪm	2;0.9
blanket	ˈblæŋkət	bæŋkɪt	2;6.19

The other attempt comes from the word *blowing* [ˈbloʊɪŋ], at 2;10.18, which is produced as [vəʊɪn]. In this case only, Jane's cluster has apparently undergone fusion, since the resulting [v] contains the place of articulation of the target [b] and the continuancy of the target [l]. The topic of fusion is discussed in more detail in section 4.3.2.1.

At 2;7.23, Jane's first target-like productions begin to emerge. From 2;7.23 to 2;8.7, five obstruent+lateral clusters are attempted. Three of these productions are target-like and two attempts undergo C_2 deletion. The three target-like productions are *closer*

['klousəɪ] → [kləusə], *black* ['blæk] → [blæk], and *glasses* ['glæsəz] → [blæk]. Meanwhile, Jane pronounces *plaster* ['plæstəɪ] and *cleaner* ['kli:nəɪ] as [pɑ:tə] and [ki:nə], respectively. I propose that the variable results observed during this time frame, represent an inter-stage in Jane's development.

Of the remaining 26 word-initial attempts made by Jane between 2;8.8 and the end of the corpus, all except two productions are target-like. Therefore, 2;8.8 marks the beginning of Stage 3, the mastery of word-initial obstruent+lateral clusters. Examples of Jane's target-like productions are presented in Table 4.15a, while 4.15b provides the two exceptions noted during this stage.

Table 4.15 Jane's Obstruent+Lateral Cluster Productions

a) Target-Like

blue	'blu:	blu:	2;8.8
play	'pleɪ	pleɪ	2;11.16
glasses	'glæsəz	glɑ:sɪz	3;2.1

b) Exceptions

please	'pli:z	pi:z	2;9.7
blowing	'blouɪŋ	vəuɪn	2;10.18

In the next section, I move to Lucy's development of obstruent+lateral clusters.

4.3.1.2 Lucy's Development of Obstruent+Lateral Clusters

Lucy attempts 72 obstruent+lateral clusters. The period from 1;5.28 to 2;2.7 can be characterized as Stage 1. 25 attempts at word-initial obstruent+lateral clusters are

made. Apart from one exceptional case, all clusters undergo C_2 deletion. A representative list is presented below in Table 4.16.

Table 4.16 Lucy's Obstruent+Lateral Cluster Attempts: C_2 Deletion

flower	ˈflaʊəɹ	paʊə	1;5.28
blue	ˈbluː	bu	1;11.16
clean	ˈkliːn	kiːn	2;0.29

The one exception to this stage mentioned above occurs at 1;11.19, approximately half way through Stage 1. This production is of the word *clip* [ˈklɪp], which Jane produces as target-like. However, further target-like productions of this cluster type do not emerge until 2;3.13, which marks the beginning of Lucy's mastery stage. During this stage, the remaining 47 clusters are produced. 44 of these clusters are target-like, while the three remaining examples, all attempts at [fl] clusters, undergo C_2 deletion. A representative list of Lucy's Stage 3 target-like productions are provided in Table 4.17a, followed by the three exceptions, in 4.17b.

Table 4.17 Lucy's Obstruent+Lateral Cluster Productions

a) Target-Like

flies	ˈflaɪz	flaɪz	2;5.4
glass	ˈglæs	glɑːs	2;9.20
please	ˈpliːz	pliːz	3;2.1

b) Exceptions

fly	ˈflaɪ	faɪ	2;3.26
floor	ˈflɒɹ	fɔ	2;3.26
floor	ˈflɒɹ	fɔː	2;9.20

Note that other [fl] clusters are consistently produced in a target-like fashion in words such as *floor*, *flewed* and *fly* within the same stage of development. From the evidence presented above, I hypothesize that [fl] clusters are of the last obstruent+lateral clusters to be acquired by the child. Building on the hypothesis in section 4.2.2.3, that articulatory factors may negatively affect some productions of sequences, it is possible here that the combination of two continuants especially in a context where the second consonant involves a lateral articulation, negatively affects the production of this cluster. In addition, [fl] is acoustically problematic. [f] sounds like [ɬ] or [l̥]. This issue is however left for further research.

In the following two subsections, I discuss Jane and Lucy's development of obstruent+rhotic clusters.

4.3.1.3 Jane's Development of Obstruent+Rhotic Clusters

In word-initial position, Jane attempts 80 obstruent+rhotic clusters. The first 24 attempts, attested between 1;5.7 and 2;3.13, all undergo C_2 deletion. A representative list of examples is provided below in Table 4.18.

Table 4.18 Jane's Obstruent+Rhotic Cluster Attempts: C_2 Deletion

brush	ˈbɹʌʃ	ba	1;5.17
grapes	ˈgɹeɪps	geɪp	1;11.19
frighten	ˈfɹaɪtən	faɪtɪn	2;3.13

At 2;3.26, the first target-like productions emerge. From this time until 2;9.22, 36 attempts at obstruent+rhotic cluster are made. 21 attempts have the second consonant in the cluster deleted, and the remaining 15 productions are target-like. This variation clearly suggests that Jane is at an inter-stage during this period. Table 4.19 below provides an exhaustive list of the number of times each cluster is attempted and whether it is reduced or target-like.

Table 4.19 Jane's Obstruent+Rhotic Cluster Attempts: Inter-Stage

Cluster Type	**C_2 Deletion**	**Target-Like**
fr	1/2	1/2
θr	3/3	0/3
br	4/8	4/8
tr	1/1	0/1
dr	10/13	3/13
kr	2/4	2/4
gr	0/5	5/5
	21/36	15/36

In addition, this table provides evidence that during this inter-stage [θr, tr, dr,] are not target-like, while [gr] is target-like and the remaining three clusters, [fr, br, kr], are target-like in approximately half of Jane's attempts. Beginning at 2;9.23 until the end of the data collection period, at 3;8.17, 20 productions are made, all of which are target-like with the exception of *draw* ['dɹɒ] at 2;10.10 which undergoes C_2 deletion, [dɔ:]. Table 4.20 presents a representative list of the target-like productions made by Jane during Stage 3 of her acquisition.

Table 4.20 Jane's Obstruent+Rhotic Cluster Productions: Target-Like

bread	bread	brɛd	2;9.23
drink	ˈdɹɪŋk	drɪŋk	3;3.22
crisps	ˈkɹɪsps	krɪps	3;8.17

In the following subsection, I present Lucy's development of obstruent+rhotic clusters.

4.3.1.4 Lucy's Development of Obstruent+Rhotic Clusters

Lucy attempts 105 obstruent+rhotic clusters. The first 22 attempts, attested between 1;5.17 and 1;11.28, undergo C_2 deletion, with the exception of *tree* [ˈtɹiː], at 1;6.24, which is target-like. A representative list of Lucy's attempts at Stage 1 is presented in Table 4.21.

Table 4.21 Lucy's Obstruent+Rhotic Cluster Attempts: C_2 Deletion

brush	ˈbɹʌʃ	bës	1;5.17
truck	ˈtɹʌk	$t^hʌk^h$	1;7.15
grape	ˈgɹeɪp	geɪp	1;11.19

An inter-stage follows Stage 1, which occurs from 2;0.2 to 2;3.13. During this inter-stage, eight clusters undergo C_2 deletion and four clusters are target-like. An exhaustive list of the target-like productions for this inter-stage is provided in Table 4.22. The pattern of C_2 deletion also observed during this time frame is similar to the reductions made at Stage 1.

Table 4.22 Lucy's Obstruent+Rhotic Cluster Productions: Target-Like

crust	ˈkɹʌst	krɪst	2;0.2
drink	ˈdɹɪŋk	drɪŋk	2;0.9
bread	ˈbɹɛd	bʊɛd	2;1.1
breads	ˈbɹɛdz	bʊɛdz	2;1.1

From 2;3.26 until 3;4.30, 71 attempts are made. 60 of the 71 attempts are target-like while the remaining 11 undergo C_2 deletion. Because the clusters that undergo C_2 deletion account for only 15.5% of the data and are unsystematically scattered across the time period, I propose that this period represents the final, mastery stage in her development of obstruent+rhotic clusters. In Table 4.23a, examples of the clusters that are target-like productions are presented, followed by the clusters that undergo C_2 deletion in Table 4.23b.

Table 4.23 Lucy's Obstruent+Rhotic Cluster Attempts

a) Target-Like

throwing	ˈθɹoʊɪŋ	frəʊɪŋ	2;3.26
drink	ˈdɹɪŋk	drɪŋk	2;5.12
probably	ˈpɹɑbəbliː	pɒbəbli	2;8.7
Grandad	ˈgɹæn,dæd	grændæ	3;2.10
throw	ˈθɹoʊ	ərəʊ	3;4.30

b) C_2 Deletion

briefcase	ˈbɹiːf,keɪs	biːfkeɪs	2;3.26
fringe	ˈfɹɪnʤ	fɪnʒ	2;6.25
cries	ˈkɹaɪz	kaɪz	2;8.17

Table 4.23b shows that Lucy does not have a systematic problem with any particular word or cluster. This observation further supports my hypothesis that Lucy has mastered word-initial obstruent+rhotic clusters at 2;3.26.

4.3.1.5 Summary of Development of Branching Onsets

The evidence presented above suggests that the Cruttenden twins' branching onsets generally undergo C_2 deletion in early productions, followed by an inter-stage characterized by fluctuating patterns before the cluster is acquired. Jane's obstruent+lateral clusters are acquired at 2;8.8, while her obstruent+rhotic clusters are acquired at 2;9.23, which is approximately one month later. In contrast, Lucy's obstruent+lateral and obstruent+rhotic clusters are acquired at 2;4.5 and 2;3.26, respectively. Lucy has thus mastered obstruent+lateral clusters four months before Jane and obstruent+rhotic clusters six months before Jane. These stages are summarized in Table 4.36.

In the following section, I describe Jane and Lucy's paths of acquisition for sC clusters.

4.3.2. Acquisition of sC Clusters

As previously mentioned in section 4.2.2, sC clusters include [s]+glide, [s]+lateral, [s]+nasal, and [s]+obstruent clusters. These cluster types are discussed in turn in the following subsections. I begin this discussion with the development of [s]+glide clusters by Jane, followed by Lucy's [s]+glide cluster development in section 4.3.2.2.

4.3.2.1 Jane's Development of [s]+Glide Clusters

Stage 1 of Jane's development ranges from 1;8.2 to 2;4.19. During this stage, eight clusters undergo a process of fusion. A representative list of the attempts that undergo fusion is presented in Table 4.24. Additionally, one attempt undergoes C_2 deletion. Jane produces *swimming* ['swɪmɪŋ] as [s̪ɪmɪn].

Table 4.24 Jane's [s]+Glide Cluster Attempts: Fusion

swimming	ˈswɪmɪŋ	pʰɪmɪn	1;19.11
swan	ˈswɑn	fɒm	2;1.22
sweetie	ˈswiːtiː	fiːti	2;4.19

These examples of fusion, characterized by a segment in the output produced by the child that has properties of both consonants forming the attempted cluster, are similar to those from a two-year old child acquiring English child named Gitanjali whose data are introduced by Gnanadesikan (2004). Some of Gitanjali's productions with consonant fusion are presented in Table 4.25.

Table 4.25 Gitanjali's Cluster Attempts: Fusion

Orthography	**IPA Target**	**IPA Actual**
sweater	ˈswɛɾɚ	fɛɾə
smell	ˈsmɛl	fɛw
drink	ˈdrʷɪŋk	bɪk
tree	ˈtrʷiː	pi
grape	ˈgrʷeɪp	bep

In the first two examples above, Gitanjali's productions have retained the sonority and manner of articulation of C_1 and the labial place of articulation of C_2. In the remaining three examples, the labial place of articulation that is articulatorily realized with [r] is preserved along with the manner features of the least sonorous consonant.

In contrast to Jane, Gitanjali displays fusion in both sC clusters and branching onsets, as illustrated above where the cluster retains the sonority of C_1 and the place of articulation of target [r], which she realizes as [w] in singleton onsets (e.g. *room* [rum] → [wum]; Gnanadesikan 2004:94).

From 2;7.0 until 3;8.1, Jane produces only target-like clusters. Examples of these six target productions are provided below in Table 4.26.

Table 4.26 Jane's [s]+Glide Cluster Productions: Target-Like

swimming	ˈswɪmɪŋ	swɪmɪn	2;7.0
swings	ˈswɪŋz	swɪŋz	3;3.22
switch	ˈswɪʧ	swɪʧ	3;8.1

Note that there is a period of three months between Stage 1 and Stage 2. While it is possible that during these three months Jane went through an inter-stage where both C_1 deletion and target-like productions were made, this cannot be verified empirically. In the following subsection, Lucy's development of [s]+glide clusters is presented.

4.3.2.2 Lucy's Development of [s]+Glide Clusters

14 attempts at [s]+glide clusters are attested in Lucy's data. The first 10 attempts occur between 1;5.29 and 2;1.11. Four of these clusters undergo C_2 deletion, while the remaining six attempts undergo fusion, which is similar the pattern of reduction presented above for Jane. Recall that Jane also uses fusion for [s]+glide clusters at Stage 1, as exemplified in Table 4.24. A representative list of Lucy's Stage 1 word-initial [s]+glide cluster attempts is presented in Table 4.27.

Table 4.27 Lucy's [s]+Glide Cluster Attempts

a) C_2 Deletion

sweetie	ˈswiːtiː	s̪iti	1;6.24
sweetie	ˈswiːtiː	s̪ipi	1;8.2
swimming	ˈswɪmɪŋ	s̪ɪmɪn	1;11.19

b) Fusion

swimming	ˈswɪmɪŋ	fɪmɪŋ	1;11.3
swimming	ˈswɪmɪŋ	fɪmɪn	2;0.18
swimming	ˈswɪmɪŋ	fɪmɪn	2;1.11

During Stage 1, only the words *sweetie* and *swimming* are attempted. From the data presented above, there appears to be progression within the stage. Between 1;6.24 and 1;11.19 the clusters undergo C_2 deletion. Between ages 1;11.3 and 2;1.11, they undergo fusion. Overall, in Stage 1 clusters are reduced to one consonant.

No more attempts are made until 2;4.19, which is when the first target-like production emerges. From 2;4.19 to 2;9.7, a total of four productions are made, all of which are target-like. These target-like productions are *swimming* ['swɪmɪŋ] → [swɪmɪn],

swans ['swɑnz] → [swɒnz], *sweet* ['swi:t] → [swi] and *sweetie* ['swi:ti:] → [swi:ti].

4.3.2.3 Jane's Development of [s]+Lateral Clusters

There are only six attempts at [s]+lateral clusters recorded in Jane's corpus. These occur between 2;5.15 and 2;5.22. At Stage 1, *sleep* ['sli:p] undergoes fusion, producing [fi:p], at 2;5.15. At 2;5.22, Jane attempts *sleep* three additional times. One of the attempts undergoes fusion, as previously shown (['sli:p] → [fi:p]). The remaining productions are target-like (['sli:p] → [sli:p]). This suggests that Jane was at an inter-stage during this period (minimally between 2;5.15 and 2;5.22). Two months later, at 2;7.23, *sleepy* ['sli:pi:] undergoes C_2 deletion and surfaces as [si:pi:]. This example is followed by one target-like production at 2;8.6 of the word *slippers* ['slɪpəɹz], which minimally suggests the beginning of the mastery stage.

4.3.2.4 Lucy's Development of [s]+Lateral Clusters

22 [s]+lateral clusters are attempted by Lucy. The first seven attempts undergo C_2 deletion. These data are grouped together as Stage 1, which occurs from 1;11.3 to 2;1.22. A representative list of these attempts is provided below in Table 4.28.

Table 4.28 Lucy's [s]+Lateral Cluster Attempts: C_2 Deletion

sleep	ˈsliːp	s̪iːp	1;11.3
slip	ˈslɪp	sɪp	1;11.28
slide	ˈslaɪd	saɪd	1;11.28

One cluster undergoes fusion during this stage. This example comes from the word sleeping [ˈsliːpɪŋ] produced as [fiːfɪŋ] at 2;1.7. No more clusters undergo C_2 deletion or fusion in the data. Between 2;3.26 and 2;9.20 only target-like productions are made. All 14 of these productions come from attempts at the word *sleep* [ˈsliːp].

In the following subsections, I discuss Jane and Lucy's development of [s]+nasal clusters.

4.3.2.5 Jane's Development of [s]+Nasal Clusters

Jane attempts eight [s]+nasal clusters. At 2;3.26, three attempts are made, all of which undergo fusion. These examples are representative of Stage 1. An exhaustive list of these clusters is presented in Table 4.29 below.

Table 4.29 Jane's [s]+Nasal Cluster Attempts: Fusion

Smarties	ˈsmɑɹtiːz	faːtiz	2;3.26
Smarties	ˈsmɑɹtiːz	faːti	2;3.26
Smartie	ˈsmɑɹtiː	faːti	2;3.26

Following Stage 1, from 2;8.7 until 2;10.10, cluster productions are either reduced or are realized in a target-like fashion. During this second stage, two of the four attempts have

C_1 deleted. These two cases, *small* and *snow*, are produced as [mɔ:l] and [n̥əʊ].[6] The two target-like productions are of the words *smack* ['smæk] → [smæk], at 2;8.7 and *smaller* ['smɒləɹ] → [smɔ:lə], at 2;9.18. Based on these data, I conclude that Jane is at Stage 2, an inter-stage in her development. Four months later at 3;2.10, Jane produces a target-like production of the word *small* ['smɒl] → [smɔ:l].

4.3.2.6 Lucy's Development of [s]+Nasal Clusters

Lucy produces eight [s]+nasal clusters between 2;2.7 and 3;5.29. All eight of these clusters are target-like. A representative list of these productions is presented in Table 4.30.

Table 4.30 Lucy's [s]+Nasal Cluster Productions: Target-Like

snake	'sneɪk	sneɪk	2;2.7
small	'smɒl	smɔ:l	2;9.18
smoke's	'smoʊks	səʊks	3;5.29

In the next subsections, I turn to Jane and Lucy's development of [s]+obstruent clusters.

[6] The devoicing of [n] in *snow* suggests fusion. However, this cannot be verified for the data available. Also, the absence of the devoicing on the [m] of *small* does not support that fusion, if any, was generalized across all examples.

4.3.2.7 Jane's Development of [s]+Obstruent Clusters

Jane attempts 36 [s]+obstruent clusters. From 1;5.20 to 3;7.10, all but three occurrences of these clusters undergo C_1 deletion. A representative list of these 33 attempts is presented below in Table 4.31.

Table 4.31 Jane's [s]+Obstruent Cluster Attempts: C_1 Deletion

spoon	ˈspuːn	pʊ	1;5.20
stuck	ˈstʌk	tʌk	2;5.12
school	ˈskuːl	kuːl	3;3.22

These data suggest that fusion only occurs in rising-sonority clusters because, as opposed to what was seen above with rising sonority sC clusters, no [s]+obstruent clusters undergo fusion. The three exceptions to Stage 1 are presented below in Table 4.32, all of which surface as target-like.

Table 4.32 Jane's [s]+Obstruent Cluster Productions: Target-Like

school	ˈskuːl	skuːl	2;7.23
school	ˈskuːl	skuːl	2;8.17
stay	ˈsteɪ	steɪ	2;11.16

Since these examples account for 8.3% of the data only, I conclude that Jane is at Stage 1 from 1;5.20 to 3;7.10. I conclude from this that Jane's acquisition of [s]+obstruent word-initial clusters took place at a much later time than all other cluster attempts discussed in this corpus.

4.3.2.8 Lucy's Development of [s]+Obstruent Clusters

Lucy attempts 39 [s]+obstruent clusters. 10 out of 11 clusters are reduced during Stage 1. These clusters undergo C_1 deletion from 1;5.21 to 2;1.7, with the exception of the word *stop* ['stɑp] at 2;0.9, which is realized as target-like. A representative list of these attempts is presented in Table 4.33.

Table 4.33 Lucy's [s]+Obstruent Cluster Attempts: C_1 Deletion

spoon	'spu:n	bəʊm	1;5.28
starlings	'stɑ:lɪŋz	tɑ:lɪŋks	1;11.19
skin	'skɪn	kɪn	2;1.7

From 2;3.26 to 3;6.28, 29 of 30 productions are target-like. I propose that this is Stage 2 in Lucy's development of [s]+obstruent clusters, characterized by mastery of these clusters. The remaining attempt made is of an [sk] cluster, which undergoes C_1 deletion. This attempt comes from the word *school* ['sku:l] at 2;9.0, which is produced as [ku:l]. *School* was also produced as target-like during the same session as above. These data suggest that [sk] clusters are among the last of the [s]+obstruent clusters to be acquired. Recall in section 4.2.2.3, David also showed difficulty with this cluster as well. The evidence in this section further supports the hypothesis by Rose and dos Santos (to appear) that contrasts between consonants articulated with the tongue may be difficult to combine within words or clusters.

4.3.2.9 Summary of Development of sC Clusters

Overall, Jane's rising-sonority clusters undergo fusion before they are target-like, while Lucy's clusters undergo C_2 deletion before they are mastered, with few examples of fusion. In all cases of rising-sonority clusters, Lucy attains the mastery stage before Jane. Lucy acquired [s]+glide clusters three months before Jane, [s]+lateral clusters four months before Jane and [s]+nasal clusters one year prior to Jane.

Focusing now on the falling-sonority clusters, both Jane and Lucy's attempted clusters undergo C_1 deletion in early productions. This is different from their rising-sonority clusters. However, their acquisition for rising-sonority clusters is similar to their falling-sonority clusters in that Lucy has mastered these clusters prior to Jane. Lucy's [s]+obstruent clusters are target-like at 2;3.26 while the evidence suggests that Jane is still at the first stage in her development at 3;7.10. This implies that Jane's acquisition of falling-sonority clusters is at least 16 months behind that of Lucy. These data are summarized in Table 4.36.

In the following section I provide a summary of the Cruttenden corpus.

4.3.3 Cruttenden Corpus Summary

Overall Jane and Lucy's branching onsets develop in a similar order: however Lucy's clusters are mastered before Jane's in all cases. On the other hand, their acquisition does vary for sC clusters. Beginning with rising-sonority clusters, Jane's most dominant form of reduction is fusion prior to her mastery stage, while Lucy's clusters typically undergo C_2 deletion. Similar to the twins' branching onsets, Lucy's clusters are

acquired before Jane's. Concerning their falling-sonority sC clusters, Jane and Lucy both reduce clusters through C_1 deletion and Lucy's masters this cluster before Jane. In general, Lucy is thus the fastest learner of the pair.

In the following section, tables are provided to illustrate each child's order and time of development.

4.4 Discussion

The data presented throughout this chapter suggest that the children in both corpora follow the same path of development for branching onsets. Their clusters undergo C_2 deletion before they are produced as target-like. Although all of the children follow the same developmental path, the time of acquisition varies within twin pairs.

In contrast to branching onsets, the children vary in their respective development of sC clusters. They show variation in their rates of acquisition as well. To clearly illustrate these findings I have devised timelines for each twin pair, which summarize and compare their path of development. Table 4.34 summarizes the stages of development for David and Mark, and Table 4.35 illustrates Jane and Lucy's stages. The legend for these tables is found below each table.

Table 4.34 Goad Corpus Path of Development for Word-Initial Consonant Clusters

Cluster	Name	3;3.21	3;4.26	3;5.26	3;7.13
O+L	D	C_2 Deletion		TL	
	M		C_2 Deletion		TL
O+R	D				TL
	M		TL		
s+G	D				
	M				TL
s+L	D				
	M				TL
s+N	D			C_1 Deletion	
	M	C_2 Deletion			
s+O	D			TL	
	M			TL	

Legend	
	Cluster reduction
	Inter-stage
	Target-like
	Indeterminate

The above table illustrates that for branching onsets both children reduce clusters through a C_2 deletion strategy before the mastery stage. Variation does emerge in the time of acquisition, however, for obstruent+lateral clusters David's clusters are target-like two months before Mark's. However, Mark acquires obstruent+rhotic clusters almost four months before David. As previously discussed, the results from the Goad corpus for rising-sonority clusters are largely inconclusive. The orders of acquisition of cluster types for both children are summarized in Table 4.35.

Table 4.35 Order of Acquisition of Cluster Types[7]

a) David's Order of Acquisition

obstruent+lateral, [s]+obstruent >> obstruent+rhotic

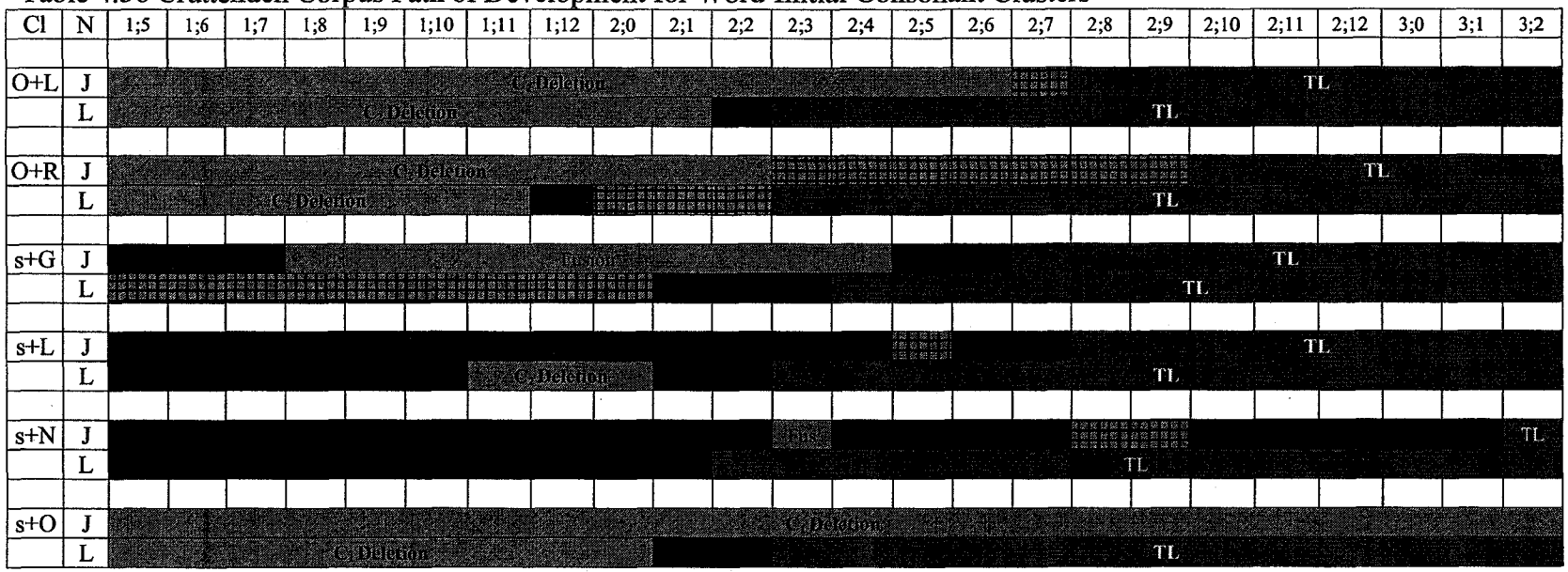
b) Mark's Order of Acquisition

obstruent+rhotic >> [s]+obstruent >> obstruent+lateral

In Table 4.36 below, Jane and Lucy's paths of development for word-initial consonant clusters are illustrated.

[7] Comma-separated clusters were acquired during the same time period; clusters separated by '>>' are acquired during distinct time periods.

Table 4.36 Cruttenden Corpus Path of Development for Word-Initial Consonant Clusters



Legend	
	Cluster reduction
	Inter-stage
	Target-like
	Indeterminate

The table on the previous page provides evidence that Jane and Lucy show variation in the order of acquisition of cluster types. Jane acquires obstruent+lateral clusters before her obstruent+rhotic clusters, while Lucy acquires obstruent+rhotic clusters at the same time as her obstruent+lateral, [s]+lateral and [s]+nasal clusters. The general order of acquisition for both children in the Cruttenden corpora is presented below in Table 4.37.

Table 4.37 Order of Acquisition of Cluster Types

a) Jane's Order of Acquisition

[s]+glide >> obstruent+lateral, [s]+lateral >> obstruent+rhotic >> [s]+nasal >> [s]+obstruent

b) Lucy's Order of Acquisition

[s]+nasal >> obstruent+lateral, obstruent+rhotic, [s]+lateral, [s]+obstruent >> [s]+glide

In addition, Lucy consistently acquires her clusters before Jane throughout the data.

The evidence presented in this section, especially that from the Cruttenden corpus, suggests that relatively little variation emerges in the order of acquisition of cluster types within twin pairs. However, the more detailed descriptions in previous sections show that tremendous variation can be found when each individual cluster is considered independently.

In the following chapter, I discuss these acquisition paths from the perspective of input frequency.

Chapter 5

FREQUENCY OF THE INPUT

5.1 Introduction

The aim of this chapter is to determine whether the frequency of the linguistic input that a child receives from the ambient language reflects the order of acquisition that the child follows. In the previous chapter, variation was characterized in terms of order and time of development as well as in the type of strategy used by the children during the stages when cluster reduction was observed. In this chapter, I address these topics from three perspectives, namely, the relative frequency of (a) individual clusters (e.g. [pl] versus [kl]), (b) cluster types (e.g. obstruent+lateral versus obstruent+rhotic), and (c) onset structures (e.g. branching onset versus sC clusters). The results provide evidence that neither the acquisition of cluster or cluster type is frequency-driven. However, when relative frequencies for branching onsets and sC clusters are compared to order of acquisition, the evidence suggests that there is a correlation between acquisition and frequency of onset structure.

This chapter is organized as follows. Section 5.2 describes the frequency information used in my thesis as well as the sources from which it has been derived. In section 5.3, relative frequencies of word-initial consonant clusters, as found by Roberts (1965), are presented and compared to the results derived from the Goad and Cruttenden corpora. Section 5.4 provides a comparison of the relative frequency of cluster types to both corpora. Relative frequencies for each structure are compared to the children's order

of acquisition in section 5.5. These three categories offer a continuum on the degree of detail included in the units compared. For example, while [pl] and [kl] are separate units where individual clusters are concerned, they are part of the same category in the *cluster type* and *onset structure* categories, by virtue of both being obstruent+lateral branching onsets. A reference to these three degrees of phonological detail will enable us to determine where correlations between the acquisition paths evidenced in the children's corpora and relative frequency exist. Finally, section 5.6 offers a discussion of the relevant findings.

5.2 Source for Frequency Data

To determine whether the frequency of the input correlates with order of acquisition, I begin with a presentation of the relative frequencies of word-initial consonant clusters as found by Roberts (1965). Roberts' corpus was built from the recorded speech of a native speaker from Minnesota, United States. This speaker produced, in what was considered normal sentences, words taken from Horn's list (Horn 1926). Horn's list is based on 5,136,816 words found in the vocabulary of American English (written) correspondence (Zettersten 1969). The words produced were phonemically transcribed following the system used in Francis (1958). A total of 15,465,010 tokens were collected.

Note that this study was published in 1965, around the time when the Cruttenden corpus, the basis for most of the comparisons below, was built. I acknowledge that it would have been preferable to use a corpus of child-directed speech, or a corpus of

spontaneous speech. This however was not possible due to time constraints. Another criticism could come from the fact that while the Cruttenden corpus documents the acquisition of British English, Roberts' frequency compilations are based on American English. However, one must keep in mind that the current study does not focus on the fine phonetic details of different dialects of English but rather on phonological properties of its onset structure, the essential aspects of which are shared by both dialects of English. Also, based on the sheer number of words compiled in Roberts's study (over 15 million), all of which were in spontaneously-produced sentences (only one word from each sentence was taken from Horn's list), one can assume that Roberts' compilations do provide a relatively reliable estimate of the distribution and frequency of sounds and clusters in the language. Zettersten (1978) provides a rank list of the 30 most frequent word-initial consonants and consonant cluster graphemes, which are listed in descending order from most frequent: PR, ST, FR, TR, GR, PL, BR, CL, and SP. Despite some variation between Roberts' and Zettersten in a few of the clusters, the overall results are similar. This supports the validity of Roberts' compilations, on which the current analysis is based. In this respect, the method used in this investigation, despite its limits, is deemed sufficient to reveal the main correlations that may exist between input statistics and phonological development.

In the following section, I report on Roberts' (1965) relative frequencies for word-initial consonant clusters. I then compare these frequency data with the order of acquisition in the Goad and Cruttenden corpora.

5.3 Relation between Frequency and the Acquisition of Individual Clusters

This section provides a comparison of relative frequencies of consonant clusters. These data are then compared to the order of acquisition followed by each child.

In Table 5.1 below, I present a summary of the relative frequency of word-initial consonant clusters as found by Roberts (1965).

Table 5.1 Relative Frequencies of Word-Initial Consonant Clusters (Roberts 1965:398)

Rank Order	Relative Frequency	Rank Order	Relative Frequency	Rank Order	Relative Frequency
pr	1.06144564	br	0.20988619	by	0.03829095
fr	0.94404990	kr	0.20703959	vy	0.02554317
st	0.79809303	sp	0.20441197	my	0.02437216
pl	0.76214410	fy	0.20345993	sn	0.01852665
tr	0.55806534	dr	0.14787998	hy	0.01409968
gr	0.33747825	bl	0.10551432	ky	0.01106268
kl	0.27743325	sm	0.06134930	py	0.01084371
kw	0.26722740	sl	0.05536098	dw	0.00101868
gl	0.24307421	fl	0.05326650	sf	0.00043794
sk	0.23458204	sw	0.04540267	ʃr	0.00032369
θr	0.21795946	tw	0.04148979		

The table above illustrates order of frequency of consonant clusters in descending order. For example, the most frequent cluster is [pr]. It appears 111492 times in the corpus, for a relative frequency of 1.06144564. This number is relative to all other word-initial consonants and consonant clusters attested in Roberts' corpus. The least frequent cluster is [ʃr], which appears only 34 times in Roberts' entire corpus, for a relative frequency of 0.00032369.

Note however that the information provided by Roberts about the method of calculation was fairly minimal. Relative frequency was calculated based on the following

formula: the number of relevant word tokens from the corpus divided by the frequency of occurrence of a given cluster in this set times 100.

Building on the rank orderings of relative frequencies presented in Table 5.1, the tables below illustrate a comparison of these frequencies with the order of acquisition of the clusters found in the Goad and Cruttenden corpora. Table 5.2 illustrates David and Mark's cluster development orders, while Table 5.3 presents Jane and Lucy's orders. For the sake of simplicity, Roberts' (1965) rank orders are provided only for the relevant consonant clusters. (Appendix B provides the ages of the children when the clusters were acquired.)

Table 5.2 Goad Corpus Order of Acquisition of Word-Initial Clusters[8]

David's Order of Acquisition	Rank	Roberts (1965) Frequency Ranks	Rank	Mark's Order of Acquisition
br	1	**pr**	1	br
		fr		tr
pl	2	**st**	2	sk
sp	3	**pl**	3	pl
		tr		
		kl		dr
		sk		fr
		br		kl
bl	4	**sp**	4	pr
kl		**dr**		sl
sl		**bl**		st
tr		**sl**		sw
		sw		

As this table shows, no apparent correlation between frequency and order of acquisition of individual clusters can be found in the Goad corpus. Neither David nor Mark appears to follow any frequency-driven pattern in their acquisition of specific consonant clusters. Indeed, no identical pattern exists between the children, as was discussed in the previous chapter; both children acquire relatively frequent clusters (e.g. [pr]) during fairly late stages, and also acquire infrequent clusters (e.g. [br]) during early stages.

In the following table, I present Jane and Lucy's order of acquisition in comparison to frequency ranks.

[8] Clusters that are acquired during the same session have been grouped together, since their rank order is the same. This applies to all subsequent tables.

Table 5.3 Cruttenden Corpus Order of Acquisition of Word-Initial Clusters

Jane's Order of Acquisition	Rank	Roberts (1965) Frequency Ranks	Rank	Lucy's Order of Acquisition
gr	1	pr	1	kr
br	2	fr	2	dr
sl	3	st	3	br
sw	4	pl	4	sn
dr kl kr	5	tr gr kl	5	bl
bl gl	6	gl sk	6	kl pl sl sp st θr
sm	7	θr		
pl sk	8	br kr	7	fl tr
fl	9	sp dr		
fr	10	bl	8	sw
pr	11	sm	9	gr
st	12	sl	10	fr
tr	13	fl	11	pr
		sw	12	sk
		sn	13	sm
			14	gl

Similar to what we saw with David and Mark, the evidence presented in Table 3.5 for Jane and Lucy does not provide supportive evidence for the hypothesis that the order of acquisition of individual clusters reflects the frequency of the input.

In sum, no correlation between the statistics in Roberts' (1965) rank list and the development paths uncovered in either the Goad or the Cruttenden corpus could be found when specific clusters are considered. I conclude from these results that frequency information cannot provide a reliable prediction for the acquisition of individual clusters. In addition, recall from the previous chapter that there is variation between twins, a fact especially evident from Jane and Lucy's data. This variation alone precludes any relation between the acquisition of specific clusters and environmental factors such as input frequency.

In the next section, I reduce the degree of phonological detail involved in the categories compared. Instead of looking at individual clusters, I address the relationship between order of acquisition and frequency from the perspective of cluster types.

5.4 Relation between Frequency and the Acquisition of Cluster Types

Since comparison of input frequency did not mirror the order of cluster development in the previous section, I have chosen to investigate whether a more general approach would yield correlations between frequency and order of acquisition. In this section, relative frequencies of cluster types from Roberts (1965) are compared to the order of acquisition of clusters types as attested in the Goad and Cruttenden corpora.

In the following table, relative frequencies of word-initial cluster types from Roberts (1965) are presented in descending order. These frequencies were calculated through adding, for each cluster type, the frequency of each individual cluster that belongs to this cluster type.

Table 5.4 Relative Frequencies of Word-Initial Clusters Types (Roberts 1965:398)

Cluster Type	**Relative Frequency**
Obstruent+Rhotic	3.68412804
Obstruent+Lateral	1.44143238
[s]+Obstruent	1.23752498
[s]+Nasal	0.07987595
[s]+Lateral	0.05536098
[s]+Glide	0.04540267

As illustrated by this table, obstruent+rhotic clusters are the most frequent clusters in the ambient language, with over twice the relative frequency of obstruent+lateral clusters. If frequency can make any prediction in this context, obstruent+rhotic clusters should thus be the first cluster type to be acquired by first language learners of English. As opposed to this, [s]+glide represents the least frequent cluster type and is predicted to be acquired last.

Following the method of data presentation used in the previous section, I present in Table 5.5 the relative frequency of cluster types and compare it to David and Mark's order of acquisition.

Table 5.5 Goad Corpus Order of Acquisition of Word-Initial Clusters Types

David's Order of Acquisition	Rank	Roberts (1965) Cluster Type Frequency Ranks	Rank	Mark's Order of Acquisition
obstruent+lateral [s]+obstruent	1	**obstruent+rhotic** **obstruent+lateral**	1	obstruent+rhotic
obstruent+rhotic	2	**[s]+obstruent**	2	[s]+obstruent
			3	obstruent+lateral

Based on the evidence discussed in the previous chapter, David acquires obstruent+lateral and [s]+obstruent clusters during the same time period. Note here that these two cluster types have fairly similar frequencies, 1.44143238 and 1.23752498, respectively. These data thus suggest that the order of acquisition attested by David correlates with input frequency. However, David acquires obstruent+rhotic clusters after obstruent+lateral and [s]+obstruent clusters, contrary to the expectation that the former should be acquired first.

As opposed to David, Mark acquires obstruent+rhotic clusters first. This is followed by the acquisition of [s]+obstruent clusters, then obstruent+lateral clusters. While Mark's acquisition path for obstruent+rhotic appears to support a frequency-based approach to phonological development, the results from the other cluster types are contrary to expectation, unless one assumes that the unexpected order for these clusters can be predicted from their similar frequencies.

However, recall that the patterns of acquisition derived for David and Mark are based on a limited set of data. This implies that some of the subtleties that arise from

more densely-populated corpora may go unnoticed. This possibility is supported in the next table, which provides a basis for discussion of Jane and Lucy's richer data set.

Table 5.6 Cruttenden Corpus Order of Acquisition of Word-Initial Clusters Types

Jane's Order of Acquisition	**Rank**	**Roberts (1965) Cluster Type Frequency Ranks**	**Rank**	**Lucy's Order of Acquisition**
[s]+glide	1	**obstruent+rhotic**	1	[s]+nasal
obstruent+lateral [s]+lateral	2	**obstruent+lateral** **[s]+obstruent** **[s]+nasal** **[s]+lateral**	2	obstruent+lateral obstruent+rhotic [s]+lateral [s]+obstruent
obstruent+rhotic	3	**[s]+glide**	3	[s]+glide
[s]+nasal	4			
[s]+obstruent	5			

As opposed to what was suggested from a portion of David and Mark's data, the data for Jane and Lucy do not support a frequency-based approach to acquisition. The richer body of evidence from the Cruttenden corpus clearly suggests that no correlations exist between input frequency and order of acquisition. Recall from Table 5.4 that the most frequent cluster type is obstruent+rhotic clusters, with a relative frequency of 3.68412804, while the next most frequent type is obstruent+lateral clusters, with a relative frequency of 1.44143238. This is a difference of 2.24269566, the largest difference that exists between all categories of cluster types. However, this observation

does not manifest itself in any way in the data from the Cruttenden corpus. Recall that none of the children in this corpus acquired obstruent+rhotic clusters first. In fact, neither did David in the Goad corpus. Mark is the only child that provides supporting evidence for the hypothesis that the order of acquisition of cluster types is influenced by their frequencies.

In the following section, I take one additional step in my investigation, by combining all relevant cluster types into only two categories, namely branching onsets and sC clusters, each of which is assumed to have a distinctive onset structure, as previously discussed in Chapter 3.

5.5 Relation between Frequency and the Acquisition of Onset Structure

As opposed to the above two sections, in this section, I provide evidence supporting the hypothesis that input frequency plays a role in phonological development. In table 5.7 below, I introduce the relative frequencies for branching onsets versus sC clusters, which are calculated in a way similar to the frequency data used in the preceding section, through adding the frequency of all relevant clusters documented in Roberts' compilation for each of the two structures under investigation. As we see in the preceding section, the development of certain types of branching onsets may be intertwined with the development of sC clusters. In order to cope with this situation, I determined the acquisition of a given onset structure based on the first occurrence of an acquired cluster type.

Table 5.7 Relative Frequencies of Word-Initial Structure Types (Roberts 1965:398)

Cluster Type	**Relative Frequency**
Branching Onsets	5.12556042
sC Clusters	1.41816458

As this table shows, branching onsets are significantly more frequent than sC clusters in English. This order is compared to the order of development of the syllable structures as attested by David and Mark, in Table 5.8, and by Jane and Lucy, in Table 5.9.

Table 5.8 Goad Corpus Order of Acquisition of Word-Initial Structure Types

David's Order of Acquisition	**Rank**	**Roberts (1965) Cluster Type Frequency Rank List**	**Rank**	**Mark's Order of Acquisition**
Branching Onsets	1	**Branching Onsets**	1	Branching Onsets
sC Clusters	2	**sC Clusters**	2	sC Clusters

Table 5.8 suggests that David and Mark's developmental paths were affected by the frequency information for each onset structure in their ambient language. Their order of acquisition mirrors the relative frequencies of branching onsets and sC clusters if one considers the acquisition of the first type of branching onsets relative to the first type of sC clusters. The same results emerge for Jane and Lucy who, as evidenced in Table 5.9, acquired at least one type of branching onsets before sC clusters.

Table 5.9 Cruttenden Corpus Order of Acquisition of Word-Initial Structure Types

Jane's Order of Acquisition	**Rank**	**Roberts (1965) Structure Type Frequency Rank List**	**Rank**	**Lucy's Order of Acquisition**
Branching Onsets	1	**Branching Onsets**	1	Branching Onsets
sC Clusters	2	**sC Clusters**	2	sC Clusters

The results presented in this section suggest that order of acquisition of structure type is in correlation with the frequency of the input. These results are in fact in agreement with those from Levelt et al.'s (1999/2000) study on the acquisition of cluster types in Dutch.

While these results from both corpora, and their similarity with Levelt et al.'s study, could lead to the conclusion that frequency does indeed play a role in phonological development, other observations put these findings in a different light. First, recall from Chapter 3 that branching onsets and sC clusters must be syllabified using different structures. While a branching onset requires two segments to be syllabified under a single constituent, sC clusters require the projection of a left-edge appendix. It is thus possible that the projection of this appendix, which makes the overall structure of the cluster relatively marked, is inherently more complex than the anchoring of two consonants under a single constituent. If this were the case, then the orders of acquisition observed in tables 5.8 and 5.9 above could be predicted independently of any statistical information. Second, recall that Levelt et al. did not in fact consider sC clusters in their analysis. It is thus impossible to claim that the results from their study and the current one can be compared in a straightforward way. Given both of these points, I conclude that while the results presented in this section appear to lend support to frequency-based approaches to

phonological development, this hypothesis cannot be taken as conclusive. Finally, given the finding of lack of correlation between individual clusters and cluster types, in sections 5.3 and 5.4, the data minimally suggest that if frequency does in fact play a role in setting developmental paths, it can only be considered as one of the factors driving acquisition, rather than as a strong predictor.

Chapter 6

CONCLUSION

6.1 Introduction

In this thesis, I addressed the general question as to whether input frequency plays a role in determining paths of phonological development in production data. The overall goal was to determine whether the linguistic environment could be considered as a determining source of variation. Based on Levelt et al.'s (1999/2000) conclusions, I hypothesized that the environment should prevent at least some degree of variation between twins and, possibly, eliminate some of the variation typically observed across non-twin learners.

My analysis was conducted on two previously-collected studies, the Goad corpus and the Cruttenden corpus. For each twin pair, I focused on variation between the twins during language acquisition, from the perspective of phonological development. More specifically, the order of acquisition of branching onsets and sC cluster was analysed.

6.2 Summary of Results

The results show that branching onsets follow the same order of development for all children in both twin pairs. These clusters undergo C_2 deletion before target-like productions emerge. sC clusters were separated into two categories, namely rising- and falling-sonority clusters. The evidence for rising-sonority clusters for the Goad corpus was deemed inconclusive, because of the limited number of attempts made by David and

Mark. However, variation emerged in the development paths of the twins in the Cruttenden corpus. Jane's clusters undergo fusion before they are realized as target-like, while Lucy's clusters undergo C_2 deletion before she reaches the mastery stage. Turning now to falling-sonority cluster acquisition, these clusters are the first sC clusters acquired by both David and Mark. This is the same pattern that emerged for Lucy; however falling-sonority clusters are the last clusters to be acquired by Jane. Overall, this evidence implies that variation does emerge in developmental paths within twin pairs. In addition, within each corpus, one child within each pair is more advanced in terms of age at the time of acquisition.

These data support previous findings which found variation between twins (e.g. Bruggemann 1970 and Leonard et al. 1980). Based on the few phonological studies of language acquisition in twins that exist, the overall generalization appears to be that when the phonological systems within twin sets are investigated, the results show that the twins do not follow the same learning path.

Following Levelt et al.'s (1999/2000) hypothesis that the order of acquisition is a reflection of the input the children receive, I hypothesized that cluster frequency plays a role in the order of acquisition of the branching onsets and sC clusters analysed. To test this hypothesis, the order of acquisition of all attempted clusters from the Goad and Cruttenden corpora were compared to the relative frequencies of individual consonant clusters, cluster types and onset structures reported by Roberts (1965).

The results show that frequency of the input from the ambient language does not mirror the order of acquisition of individual clusters. In fact, there is no correlation

between the order of acquisition and the frequencies provided by Roberts. Furthermore, there is variation within twin pairs.

Similarly, when the frequencies of cluster types are compared to the acquisition of cluster types, the results do not fully support the hypothesis that acquisition is frequency-driven. Also in line with the results from the first comparison, there is variation within twin pairs.

In a last attempt to test whether frequency influences acquisition, onset structures are investigated. The results suggest that the children's acquisition is influenced by the overall frequency of onset structures. All four children acquire branching onsets before sC clusters. This is predicted by a frequency-based approach since branching onsets are more frequent than sC clusters in the ambient language. However, structure is an alternative explanation.

My results thus suggest that only the frequency of the structures can be correlated with phonological development, but that frequency cannot enable predictions based on more refined units. I conclude from this variation that environmental factors such as frequency may play a role but do not enable us to produce very refined predictions with regard to specific subsets of clusters that can be syllabified within a single structural configuration.

6.3 Discussion

In addition to the limitations mentioned in various portions of the thesis, there exist two main limitations in the current study, both of which in fact affect several similar

studies of phonological development based on production data. The first limitation pertains to the respective orders of acquisition of the different units discussed in this thesis. Recall that the developmental orders observed for each child are based on the ages of the children at the time when their first consistent target-like productions of a given cluster were recorded. As pointed out by Pan and Snyder (2003) in their criticism of the Levelt et al. (1999/2000) study, this method does not directly assess the orders of acquisition but rather the orders in which the units appear in the corpus. Similar methods show similar limitations. For example, the phone trees used by Leonard et al. (1980), as discussed in Chapter 2, suffer from the same limitations. Indeed, Goad & Ingram (1987) deem the information coming from such methodologies to be inconclusive at best.

The second limitation relates to the method used to determine the frequency relations in input that the child is receiving. Many frequency studies are based on combinations of genre types of written language (Kučera and Francis 1967, Carroll, Davies and Richman 1971 and Zettersten 1978), of spoken language (Voelker 1937, Hayden 1950, Roberts 1965 and Higginbottom 1962, *The British National Corpus* (http://www.natcorp.ox.ac.uk/)), and, more recently, of child-directed speech, which can be obtained from the CHILDES database.[9] Each of these types of studies has its own negative aspect. For example, it is plausible that the corpora of written language contain more formal language than everyday spoken language. Frequencies based on spoken language, although slightly more informative for phonological studies, are usually recorded from on a limited number of speakers. Consequently, it is the speakers' idiolects

[9] Frequencies of child-directed speech are based on corpora of recorded adult speech documented during recording sessions with children.

or regional varieties that are being documented, not actual data on the overall population of speakers. As opposed to these, studies that use child-directed speech as their corpora provide the most accurate accounts for the linguistic input that the child receives. However, while the frequency information gathered from one such study should be relevant to study the phonological development of the child whose caregiver is being recorded, it is not clear to what extent the frequency data can be extended to studies of other children's language development.

The limitations discussed above are, in some ways, inherent to all naturalistic studies of phonological development. To circumvent the first limitation, one would need a new method incorporating an experimental component whereby the child being recorded would be probed for all cluster types in his/her language during every recording session. For example, for every recording session, the children could be asked to identify picture cards containing words in which all of the branching onsets and sC clusters possible in the language are represented, if possible with multiple words for each cluster, in order to avoid, or to be able to minimally detect, lexical effects.

Concerning the second issue discussed above, a method is required to document the speech to which the child under investigation is exposed. Such a study would result in two corpora, one of child language and another of the ambient language, which would include both child-directed speech and some notion of the overall properties of the language spoken in the child's environment (see van de Weijer (1998) for such a study in Dutch). Each of the corpora could then be analysed simultaneously for consonants, consonant clusters, word forms and so on. These results could then reveal more subtle

effects than what can be revealed from the methods used in the published literature. A study of this type would provide a better evaluation of the frequency properties in the input that the child is exposed to, which would help answer some of the questions left open by the existing studies on the topic (e.g. Barrett, Harris and Chasin 1991, Hart 1991, Leonard et al. 1980, Levelt et al. 1999/2000 and the current one).

6.4 Conclusion

This thesis offers a contribution to an area of research in phonological development that relates to on-going debates concerning the sources of the variation observed in child language. It provides insight into how frequency may or may not affect phonological development in production. The results emerging from this research suggest that frequency cannot be taken as a strong predictor for phonological development. However, the relationships between frequency and the development of particular onset structures should not be overlooked. Indeed, frequency and markedness often enter into an inverse relation, namely, high-frequency items tend to be unmarked across languages (e.g. contributions to Paradis and Prunet 1991). This relationship, if it were fully understood, would potentially shed additional light on the nature of the representation and constraints that regulate the acquisition and use of linguistic units.

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APPENDIX A
Data Compilation

Legend

Cluster Type

obs+lat-I	word-initial obstruent+lateral clusters
obs+lat-M	word-medial obstruent+lateral clusters
obs+rho-I	word-initial obstruent+rhotic clusters
obs+rho-M	word-medial obstruent+rhotic clusters
s+gli-I	word-initial strident+glide clusters
s+gli-M	word-medial strident+glide clusters
s+lat-I	word-initial strident+lateral clusters
s+lat-M	word-medial strident+lateral clusters
s+nas-I	word-initial strident+nasal clusters
s+nas-M	word-medial strident+nasal clusters
s+obs-I	word-initial strident+obstruent clusters
s+obs-M	word-medial strident+obstruent clusters
s+obs-F	word-final strident+obstruent clusters

Realization

1	Target-Like
2	C_1 Deletion
3	C_2 Deletion
4	Complete Deletion
5	Fusion
-	Clusters containing more than 2 clusters
[*]	CHAT code that flags a speech error detected in the child's production

David

Date	Orthography	IPATarget	IPAActual	ClusterType	Real	Age
1983-09-22	talk < of > clothes	ˈtɒkˈʌvˈkloʊðz	ˌtɑkəˈgod	obs+lat-I	3	3;03.21
1983-09-22	I talk about clothes	ˈaɪˈtɒkəˈbaʊtˈkloʊðz	ʌˌtɑkəbʌtˈgoz	obs+lat-I	3	3;03.21
1983-09-22	clothes	ˈkloʊðz	ˈkozɪ	obs+lat-I	3	3;03.21
1983-09-22	yea < I > talk about clothes	ˈjeɪˈaɪˈtɒkəˈbaʊtˈkloʊðz	jɛʔɛˌdɑkbʌtˈgoz	obs+lat-I	3	3;03.21
1983-09-22	play at beach	ˈpleɪˈætˈbiːʧ	ˌbejætˈbitʃ	obs+lat-I	3	3;03.21
1983-11-27	clock	ˈklɑk	kɑk	obs+lat-I	3	3;05.26
1983-11-27	I want play that	ˈaɪˈwɑntˈpleɪˈðæt	əwɑntbedæt	obs+lat-I	3	3;05.26
1983-11-27	play the rain	ˈpleɪðəˈɹeɪn	pledəren	obs+lat-I	1	3;05.26
1983-11-27	play	ˈpleɪ	ple	obs+lat-I	1	3;05.26
1983-11-27	played it on back and for	ˈpleɪdˈɪtˈɑnˈbækˈændˈfɒɹ	pledɛʔɑnbækənfoɹ	obs+lat-I	1	3;05.26
1983-11-27	play	ˈpleɪ	ple	obs+lat-I	1	3;05.26
1983-11-27	play rain	ˈpleɪˈɹeɪn	plewen	obs+lat-I	1	3;05.26
1984-01-14	now let close it	ˈnaʊˈletˈklouzˈɪt	naʊlətklozɪt	obs+lat-I	1	3;07.13
1984-01-14	red and black	ˈɹɛdˈændˈblæk	ɹɛdənblæk	obs+lat-I	1	3;07.13
1984-01-14	that is a black cat	ˈðætˈɪzəˈblækˈkæt	dætɪsəblækkæt	obs+lat-I	1	3;07.13
1984-01-14	red and um black	ˈɹɛdˈændˈʌmˈblæk	rɛdənəmblæk	obs+lat-I	1	3;07.13
1983-09-22	umbrella	əmˈbɹɛlə	ˈaʊmbɛlo	obs+rho-M	3	3;03.21
1983-09-22	umbrella	əmˈbɹɛlə	ˈaʊmbɛˌlio	obs+rho-M	3	3;03.21
1983-10-27	why you bought new umbrella ?	ˈwaɪˈjuːˈbɑtˈnuːəmˈbɹɛlə	waɪyubɑtnuʌmbɹɛlʌ	obs+rho-M	1	3;04.26

1983-10-27	why umbrella	ˈwaɪəmˈbɪɛlə	waɪʌmbɪɛl	obs+rho-M	1	3;04.26
1983-09-22	cause where < > the dots from it	ˈkɑzˈwɛɪðəˈdɑtsˈfɪʌmˈɪt	kʌzwɛɪɛdæbdidʌtsfʌmɪt	obs+rhoI	3	3;03.21
1983-09-22	hanging out dry	ˈhæŋɪŋˈaʊtˈdɪaɪ	hɛŋɪŋɑʊtdɑɪ	obs+rhoI	3	3;03.21
1983-09-22	< I press > button down	ˈaɪˈpɪɛsˈbʌtənˈdaʊn	ʌwəsbʌtəndaʊ	obs+rhoI	2	3;03.21
1983-09-22	it < broke off >	ˈɪtˈbɪoʊkˈɒf	ɪtbɪʌkʌf	obs+rhoI	1	3;03.21
1983-09-22	it got broken	ˈɪtˈgɑtˈbɪoʊkən	ɪtgɑtbwokɛn	obs+rhoI	1	3;03.21
1983-10-27	I drawing my fingers	ˈaɪˈdɪɒɪŋˈmaɪˈfɪŋgəɪz	aɪdaɪngmaɪdɪngəɪz	obs+rhoI	3	3;04.26
1983-10-27	I drawing baby one	ˈaɪˈdɪɒɪŋˈbeɪbiːˈwʌn	ədaɪngbebiwʌn	obs+rhoI	3	3;04.26
1983-11-27	that present for her	ˈðætˈpɪɛzəntˈfɒɪhəɪ	dətwɛsəntvoɪhəɪ	obs+rhoI	2	3;05.26
1984-01-14	let me try them on	ˈletˈmiːˈtɪaɪˈðɛmˈɑn	letmitwaɪðɛmɑn	obs+rhoI	1	3;07.13
1984-01-14	< slide > it on kitty cat	ˈslaɪdˈɪtˈɑnˈkɪtiːˈkæt	saɪdɪʔɑnkɪdikæt	s+lat-I	3	3;07.13
1984-01-14	so he can sleep	ˈsoʊˈhiːˈkænˈsliːp	soikænlip	s+lat-I	2	3;07.13
1984-01-14	so he can sleep at dark time	ˈsoʊˈhiːˈkænˈsliːpˈætˈdɑɪkˈtaɪm	soikænlipætdɑɪktaɪm	s+lat-I	2	3;07.13
1984-01-14	but they don't work with slippers	ˈbʌtˈðeɪˈdɑntˈwʌɪkˈwɪðˈslɪpəɪz	bʌtðɛdontwəɪkwɪθslɪpəɪz	s+lat-I	1	3;07.13
1983-11-27	and this < small > one on your head	ˈændˈðɪsˈsmɒlˈwʌnˈɑnˈjɒɪˈhɛd	ʔændɪsʔowʌnɑnyoɪhɛd	s+nas-I	-	3;05.26
1983-11-27	he smiled	ˈhiːˈsmaɪld	himaɪjʊd	s+nas-I	2	3;05.26
1983-10-27	when this get lost , you will have this	ˈwɛnˈðɪsˈgɛtˈlɒstˈjuːˈwɪlˈhævˈðɪs	wəndɪsgɛtlɑstyuwəlævdɪs	s+obs-F	1	3;04.26
1983-11-27	you < put > first	ˈjuːˈpʊtˈfʌɪst	jupənbəɪ	s+obs-F	4	3;05.26

1983-11-27	you put that in first	ˈjuːˈpʊtˈðætənˈfʌɪst	jubətdætɪnbəɪs	s+obs-F	3	3;05.26
1983-11-27	I just wanted her	ˈaɪˈʤʌstˈwɒntədhəɪ	aɪʤəswɑntədhəɪ	s+obs-F	3	3;05.26
1983-11-27	look Scardy cat	ˈlʊkˈskaɪdiːˈkæt	ʊkhaɪikœ	s+obs-I	-	3;05.26
1983-11-27	little spoon	ˈlɪtəlˈspuːn	lɪtspun	s+obs-I	1	3;05.26
1984-01-14	scared	ˈskɛɪd	giɪ	s+obs-I	2	3;07.13
1984-01-14	he got purring so he can't get scared	ˈhiːˈgɑtˈpʌɪɪŋˈsoʊˈhiːˈkæntˈgɛt ˈskɛɪd	igɑtpowiŋdoikənˀgətqiɪd	s+obs-I	2	3;07.13
1984-01-14	scared	ˈskɛɪd	kiɪ	s+obs-I	2	3;07.13
1984-01-14	why they work with special boots	ˈwaɪˈðeɪˈwʌɪkˈwɪðˈspɛʃəlˈbuːts	waɪðewəɪkwɪsspætɪkbuts	s+obs-I	1	3;07.13
1983-09-22	a basket	əˈbæskət	ʔmpækɪt	s+obs-M	2	3;03.21
1983-10-27	your extra key	ˈjɒɪˈɛkstɪəˈkiː	jəɪɛksəɪgi	s+obs-M	3	3;04.26
1983-11-27	rested on her back	ˈɪɛstədˈɑnhəɪˈbæk	ɪɛstɪdɑnəɪbæk	s+obs-M	1	3;05.26
1984-01-14	she resting	ˈʃiːˈɪɛstɪŋ	ʧəwɛstɪŋ	s+obs-M	1	3;07.13

Mark

Date	Orthography	IPATarget	IPAActual	ClusterType	Real	Age
1983-09-22	oh you clothes	ˈoʊˈjuːˈkloʊðz	ˈʔəjuˌkʰoz	obs+lat-I	3	3;03.21
1983-09-22	I closed it	ˈaɪˈkloʊzdˈɪt	ˈʔaɪˈkʰozˌdɪt	obs+lat-I	3	3;03.21
1983-10-27	I closed it	ˈaɪˈkloʊzdˈɪt	aɪkozdɪt	obs+lat-I	3	3;04.26
1983-11-27	I closed it only little bit	ˈaɪˈkloʊzdˈɪtˈoʊnliːˈlɪtəlˈbɪt	aɪkozdɪtonlililɪdlbɪt	obs+lat-I	3	3;05.26
1983-11-27	we're playing baseball	ˈwɪɹˈpleɪŋˈbeɪsbɒl	wəɹbeŋbesbɑl	obs+lat-I	3	3;05.26
1983-11-27	I play	ˈaɪˈpleɪ	aɪbe	obs+lat-I	3	3;05.26
1983-11-27	I got this < navy > blue < too >	ˈaɪˈgɑtˈðɪsˈneɪviːˈbluːˈtuː	aɪgotdɪsnivebudu	obs+lat-I	3	3;05.26
1983-11-27	this a good place for them	ˈðɪsəˈgʊdˈpleɪsˈfɒɹˈðɛm	dɪsəgʊdplesfoɹðɛm	obs+lat-I	1	3;05.26
1983-11-27	here a good place	ˈhɪɹəˈgʊdˈpleɪs	hiɹəgʊdples	obs+lat-I	1	3;05.26
1984-01-14	I closed it	ˈaɪˈkloʊzdˈɪt	əklozdɪt	obs+lat-I	1	3;07.13
1984-01-14	do you want it closed ?	ˈduːˈjuːˈwɑntˈɪtˈkloʊzd	djuwæntɪtklozd	obs+lat-I	1	3;07.13
1984-01-14	climb up here ?	ˈklaɪmˈʌpˈhɪɹ	klɑɪmʌpɪɹ	obs+lat-I	1	3;07.13
1984-01-14	can we take your cat please	ˈkænˈwiːˈteɪkˈjɒɹˈkætˈpliːz	kɛnwitekjəɹkætpliz	obs+lat-I	1	3;07.13
1983-09-22	bounce down on piglet	ˈbaʊnsˈdaʊnˈɑnˈpɪglət	ˈbaʊnsˈdaˌuːʧːˀʌnˈpɪgət	obs+lat-M	3	3;03.21
1983-10-27	very gently	ˈvɛɹiːˈʤentliː	vɛɹidɛntli	obs+lat-M	1	3;04.26
1983-09-22	ya brown	ˈjɑˈbɹaʊn	ˈjæˈdaˌun	obs+rho-I	3	3;03.21
1983-09-22	< three >	ˈθɹiː	ˌtwiː	obs+rho-I	1	3;03.21
1983-09-22	he bringing tiger up	ˈhiːˈbɹɪŋɪŋˈtaɪgəɹˈʌp	ʔiˌbɹɪŋgɪŋˈtaɪgəɹʌp	obs+rho-I	1	3;03.21
1983-09-22	he bringing tiger down	ˈhiːˈbɹɪŋɪŋˈtaɪgəɹˈdaʊn	hibɹɪŋgiŋtaɪgəɹˈaɑˌun	obs+rho-I	1	3;03.21

1983-11-27	ya these are simple screws	ˈjɑˈðiːzˈɑɹˈsɪmpəlˈskɹuːz	jædizəɹzɪmplskuz	obs+rho-I	-	3;05.26
1984-01-14	a bottom drawer	əˈbɑtəmˈdɹɒɹ	əbɑdəmdoɹ	obs+rho-I	3	3;07.13
1984-01-14	three big ones	ˈθɹiːˈbɪgˈwʌnz	θwibɪgwʌnz	obs+rho-I	1	3;07.13
1984-01-14	because you had to bring me down so I could	bɪˈkɒzˈjuːˈhædˈtuːˈbɹɪŋˈmiːˈdaʊn ˈsoʊˈaɪˈkʊd	bikʌzjuhædəbwɪŋmidaʊnsoaɪkʊ	obs+rho-I	1	3;07.13
1984-01-14	three little money and three big ones	ˈθɹiːˈlɪtəlˈmʌniːˈændˈθɹiːˈbɪgˈwʌnz	θwilɪdəlmʌniənθwibɪgwʌnz	obs+rho-I	1	3;07.13
1984-01-14	one two three four five	ˈwʌnˈtuːˈθɹiːˈfɒɹˈfaɪv	wʌntuθwifoɹfɑɪv	obs+rho-I	1	3;07.13
1984-01-14	three little ones	ˈθɹiːˈlɪtəlˈwʌnz	fwilɪtəlwʌnz	obs+rho-I	1	3;07.13
1984-01-14	hey this came from your cat	ˈheɪˈðɪsˈkeɪmˈfɪʌmˈjɒɹˈkæt	hedɪskemfwomjoɹkæt	obs+rho-I	1	3;07.13
1984-01-14	three little money and three big ones	ˈθɹiːˈlɪtəlˈmʌniːˈændˈθɹiːˈbɪgˈwʌnz	θwilɪdəlmʌniənθwibɪgwʌnz	obs+rho-I	1	3;07.13
1984-01-14	if you want , stop you just press this thing and you stop	ˈɪfˈjuːˈwɑntˈstɑpˈjuːˈʤʌstˈpɹɛsˈðɪs ˈθɪŋˈændˈjuːˈstɑp	ɪfjuwɑnˀstɑpjudəsbwɛsdɪsθɪŋənj ustɑp	obs+rho-I	1	3;07.13
1984-01-14	no , you didn't want your drawer open	ˈjuːˈdɪdn̩tˈwɑntˈjɒɹˈdɹɒɹˈoʊpən	nojulɪdnwænjəɹdɹoɹopɛn	obs+rho-I	1	3;07.13
1983-09-22	I get up umbrella	ˈaɪˈgɛtˈʌpəmˈbɹɛlə	ˈʔɑ̱ɪgɛɾʌpˈbɛlʌ	obs+rho-M	3	3;03.21
1983-09-22	ya umbrella	ˈjɑəmˈbɹɛlə	ˌjæˈbɛlʌ	obs+rho-M	3	3;03.21
1983-10-27	only mommy have umbrella	ˈoʊnliːˈmɑmiːˈhævəmˈbɹɛlə	onimɑmijævʌmbɛlʌ	obs+rho-M	3	3;04.26
1983-10-27	we have umbrella	ˈwiːˈhævəmˈbɹɛlə	wijʌvʌmbɹɛlʌ	obs+rho-M	1	3;04.26
1983-10-27	umbrella	əmˈbɹɛlə	ʌmbɹɛlʌ	obs+rho-M	1	3;04.26
1984-01-14	see it goes on my sweater	ˈsiːˈɪtˈgoʊzˈɑnˈmaɪˈswɛtəɹ	sɪɪtgozɑnmaɪswædəɹ	s+gli-I	1	3;07.13

1984-01-14	sometimes I like take my slippers off	səmˈtaɪmzˈaɪˈlaɪkˈteɪkˈmaɪˈslɪpəɪz ˈɒf	sʌmtaɪmsaɪlaɪktekmaɪzlɪpəɪɑf	s+lat-I	1	3;07.13
1983-09-22	and snails	ˈændˈsneɪlz	ʔənˈzɛ̯oz̯	s+nas-I	3	3;03.21
1983-10-27	he just likes be outside	ˈhiːˈʤʌstˈlaɪksˈbiːˈaʊtˈsaɪd	hiʤəslərlesbiaʊtsaɪd	s+obs-F	3	3;04.26
1983-10-27	he just going to go into our back yard	ˈhiːˈʤʌstˈgoʊɪŋˈtuːˈgoʊˌɪnˈtuːˈaʊəɪ ˈbækˈjɑɪd	iʤəsgoɪŋtəgoɪnuɑɪbækyɑɪd	s+obs-F	3	3;04.26
1984-01-14	if you want , stop you just press this thing and you stop	ˈɪfˈjuːˈwɑntˈstɑpˈjuːˈʤʌstˈpɹɛsˈðɪs ˈθɪŋˈændˈjuːˈstɑp	ɪfjuwɑnˀstɑpjudəsbwɛsdɪsθɪŋənj ustɑp	s+obs-F	3	3;07.13
1984-01-14	I < must > put it near this	ˈaɪˈmʌstˈpʊtˈɪtˈnɪɹˈðɪs	aɪʌspʊtɪtnɪɹdɪs	s+obs-F	3	3;07.13
1984-01-14	< why > you want stop , you just push this thing	ˈwaɪˈjuːˈwɑntˈstɑpˈjuːˈʤʌstˈpʊʃˈðɪs ˈθɪŋ	waɪjuwɑnˀstɑpyudəspʊsdɪsdɪŋ	s+obs-F	3	3;07.13
1984-01-14	I just wanted it	ˈaɪˈʤʌstˈwɒntəˈdɪt	aɪdəswæntədɪt	s+obs-F	3	3;07.13
1984-01-14	you just push this thing if you wanna stop	ˈjuːˈʤʌstˈpʊʃˈðɪsˈθɪŋˈɪfˈjuːˈwɑnə ˈstɑp	judəspʊsdɪsɪŋɪfjuwɑnəstɑp	s+obs-F	3	3;07.13
1984-01-14	it fit on my wrist	ˈɪtˈfɪtˈɑnˈmaɪˈɹɪst	ɪtfɪtɑnmaɪwɪst	s+obs-F	1	3;07.13
1984-01-14	last one	ˈlæstˈwʌn	læstwʌn	s+obs-F	1	3;07.13
1983-10-27	scary cat	ˈskɛɹiːˈkæt	skɛɹikæt	s+obs-I	1	3;04.26
1983-10-27	I don't wanna scare her	ˈaɪˈdɑntˈwɑnəˈskɛɹhəɹ	aɪdowʌnəskeo	s+obs-I	1	3;04.26
1983-11-27	ya these are simple screws	ˈjɑˈðiːzˈɑɹˈsɪmpəlˈskɹuːz	jædizəɹzɪmplskuz	s+obs-I	-	3;05.26
1984-01-14	if you want , stop you just press this thing and you stop	ˈɪfˈjuːˈwɑntˈstɑpˈjuːˈʤʌstˈpɹɛsˈðɪs ˈθɪŋˈændˈjuːˈstɑp	ɪfjuwɑnˀstɑpjudəsbwɛsdɪsθɪŋənj ustɑp	s+obs-I	1	3;07.13

Mark

1984-01-14	why they have < stamps > on them ?	ˈwaɪˈðeɪˈhævˈstæmpsˈɑnˈðɛm	waɪdeævstæpsɑnðəm	s+obs-I	1	3;07.13
1984-01-14	you just push this thing if you wanna stop	ˈjuːˈʤʌstˈpʊʃˈðɪsˈθɪŋˈɪfˈjuːˈwɑnə ˈstɑp	judəspʊsdɪsɪŋɪfjuwɑnəstɑp	s+obs-I	1	3;07.13
1984-01-14	< why > you want stop , you just push this thing	ˈwaɪjuːˈwɑntˈstɑpˈjuːˈʤʌstˈpʊʃˈðɪs ˈθɪŋ	waɪjuwɑnˀstɑpyudəspʊsdɪsdɪŋ	s+obs-I	1	3;07.13
1984-01-14	if you want , stop you just press this thing and you stop	ˈɪfˈjuːˈwɑntˈstɑpˈjuːˈʤʌstˈpɹɛsˈðɪs ˈθɪŋˈændˈjuːˈstɑp	ɪfjuwɑnˀstɑpjudəsbwɛsdɪsθɪŋənj ustɑp	s+obs-I	1	3;07.13
1984-01-14	scardy	skɛɹdi	skɛɹdi	s+obs-I	1	3;07.13
1984-01-14	these are water skis	ˈðiːzˈɑɹˈwɒtəɹˈskiːz	ðizɑɪwɑdəɪskiz	s+obs-I	1	3;07.13
1983-11-27	baseball	ˈbeɪsbɒl	besbɑl	s+obs-M	1	3;05.26
1983-11-27	ya baseball	ˈjɑˈbeɪsbɒl	jɛbesbɑl	s+obs-M	1	3;05.26
1983-11-27	we're playing baseball	ˈwɪɹˈpleɪɪŋˈbeɪsbɒl	wəɪbɛŋbesbɑl	s+obs-M	1	3;05.26

Jane

Date	Orthography	IPATarget	IPAActual	ClusterType	Real	Age
1968-10-24	plane	'pleɪn	beɪ	obs+lat-I	3	1;05.29
1968-12-27	please	'pliːz	pʰɪi	obs+lat-I	3	1;08.02
1969-04-07	glasses	'glæsəz	gɑːgɑ [*]	obs+lat-I	3	1;11.13
1969-04-13	God bless	'gɑd'blɛs	gɒ bɛ [*]	obs+lat-I	3	1;11.19
1969-04-13	Daddy's glasses	'dædiːz'glæsəz	dædi gɑgɑ [*]	obs+lat-I	3	1;11.19
1969-04-13	orange clinic	'ɒɹənʤ'klɪnɪk	aɪn kɪni [*]	obs+lat-I	3	1;11.19
1969-05-04	more climbing over	'mɒɹ'klaɪmɪŋ'oʊvəɹ	mɑː kaɪnʊɑʊɑ	obs+lat-I	3	2;00.09
1969-05-04	climb over	'klaɪm'oʊvəɹ	kaɪnəʊɑʊɑ	obs+lat-I	3	2;00.09
1969-05-05	another fly	ə'nʌðəɹ'flaɪ	lɛləʊ faɪ [*]	obs+lat-I	3	2;00.10
1969-05-26	another flower	ə'nʌðəɹ'flaʊəɹ	lɛleʊ faʊ	obs+lat-I	3	2;01.01
1969-06-01	on a plate	'ɑnə'pleɪt	ɒn ə peɪ [*]	obs+lat-I	3	2;01.07
1969-06-01	blue one	'bluː'wʌn	bu [*] wʌm	obs+lat-I	3	2;01.07
1969-06-16	go away fly	'goʊəw'weɪ'flaɪ	gəʊ weɪ fa	obs+lat-I	3	2;01.22
1969-07-02	play pennies Mummy	'pleɪ'pɛniːz'mʌmiː	pʰeɪ [*] pɛnɪə [*] mʌmi	obs+lat-I	3	2;02.07
1969-08-20	got one down the floor	'gɑt'wʌn'daʊnðə'flɒɹ	gɒt wʌm daʊn ə fɔː [*]	obs+lat-I	3	2;03.26
1969-08-30	got a flag	'gɑtə'flæg	gɒt ə ɐæg [*]	obs+lat-I	3	2;04.05
1969-10-07	please have that a little while	'pliːz'hæv'ðætə'lɪtəl'waɪl	piːz [*] hæv dæt ə lɪtʊ waɪʊ	obs+lat-I	3	2;05.12
1969-10-07	Mummy like to blow off it	'mʌmiː'laɪk'tuː'bloʊ'ɒf'ɪt	mʌmi laɪk ə bəʊ [*] ɒf ɪt	obs+lat-I	3	2;05.12
1969-10-19	climb over again	'klaɪm'oʊvəɹə'gɛn	kaɪm əʊvə əgeɪn	obs+lat-I	3	2;05.24
1969-11-13	that's paper blanket	'ðæts'peɪpəɹ'blæŋkət	ðæts peɪpə bæŋkɪt [*]	obs+lat-I	3	2;06.19

1969-12-06	it's on a plate	ˈɪtsˈɑnəˈpleɪt	ɪs ɒn ə peɪt [*]	obs+lat-I	3	2;07.11
1969-12-18	put my closer	ˈpʊtˈmaɪˈkloʊsəɹ	pʊ maɪ [*] kləʊsə	obs+lat-I	1	2;07.23
1969-12-31	me got some black ones	ˈmiːˈgɑtˈsʌmˈblækˈwʌnz	mɑ [*] gɒt sʌm blæk wʌnz	obs+lat-I	1	2;08.06
1970-01-01	I want a bit of plaster	ˈaɪˈwɑntəˈbɪtˈʌvˈplæstəɹ	aɪ wɒnt ə bɪt ə pɑːtə [*]	obs+lat-I	3	2;08.07
1970-01-01	that going to dry cleaner	ˈðætˈgoʊɪŋˈtuːˈdɹaɪˈkliːnəɹ	dæ [*] gəʊɪn tə daɪ [*] kiːnə [*]	obs+lat-I	3	2;08.07
1970-01-01	you nearly knock my glasses	ˈjuːˈnɪɹliːˈnɑkˈmaɪˈglæsəz	u nɪəli nɒk [*] maɪ glɑːsɪz	obs+lat-I	1	2;08.07
1970-01-02	my doesn't like a blue one	ˈmaɪˈdʌznt̩ˈlaɪkəˈbluːˈwʌn	maɪ [*] dʌzn̩ [*] laɪk ə bluː wʌn	obs+lat-I	1	2;08.08
1970-01-11	can I play those when I come back to Sunday school	ˈkænˈaɪˈpleɪˈðoʊzˈwɛnˈaɪˈkʌm ˈbækˈtuːˈsʌnˌdeɪˈskuːl	kæn aɪ pleɪ ðəʊz [*] wɛn aɪ kʌm bæk tə [*] sʌndeɪ skuːl.	obs+lat-I	1	2;08.17
1970-01-11	plug mine in	ˈplʌgˈmaɪnən	plʌg maɪn ɪn	obs+lat-I	1	2;08.17
1970-02-01	can I please have a penny to pay	ˈkænˈaɪˈpliːzˈhævəˈpɛniːˈtuːˈpeɪ	kæn aɪ piːz [*] hæv ə pɛni tə peɪ	obs+lat-I	3	2;09.07
1970-02-14	don't put on the floor	ˈdɑntˈpʊtˈɑnðəˈflɒɹ	dəʊn pʊt ɒn ə flɔː	obs+lat-I	1	2;09.20
1970-02-16	I play with Daddy's briefcase	ˈaɪˈpleɪˈwɪðˈdædiːzˈbɹiːfˌkeɪs	aɪ pleɪ wɪð dædɪz biːfkeɪs [*]	obs+lat-I	1	2;09.22
1970-02-16	he want to play with it	ˈhiːˈwɑntˈtuːˈpleɪˈwɪðˈɪt	iː wɒnt [*] tə pleɪ wɪð ɪt	obs+lat-I	1	2;09.22
1970-03-07	I playing London	ˈaɪˈpleɪɪŋˈlʌndən	aɪ pleɪŋ lʌndən	obs+lat-I	1	2;10.10
1970-03-15	that blowing	ˈðætˈbloʊɪŋ	ðæ vəʊɪn [*]	obs+lat-I	5	2;10.18
1970-03-23	I playing jig saws	ˈaɪˈpleɪɪŋˈʤɪgˈsɒz	aɪ pleɪn dʒɪgsɔːz	obs+lat-I	1	2;10.26
1970-03-23	there's a blue sky Lulu	ˈðɛɪzəˈbluːˈskaɪˈluːˌluː	ðɛəz ə bluː kaɪ [*] lulu	obs+lat-I	1	2;10.26

1970-03-23	the shops are closed on Sunday	ðəˈʃɑpsˈɑɹˈklouzdˈɑnˈsʌnˌdeɪ	ə ʃɒps ə kləʊz [*] ɒn sʌndeɪ	obs+lat-I	1	2;10.26
1970-03-23	I playing jigsaws	ˈaɪˈpleɪɪŋˈʤɪgˌsɒz	aɪ pleɪɪn ɵɪgsɔːz [*]	obs+lat-I	1	2;10.26
1970-03-23	I want to play jigsaws	ˈaɪˈwɑntˈtuːˈpleɪˈʤɪgˌsɒz	aɪ wɒnt tə pleɪ ðɪgsɔːz [*]	obs+lat-I	1	2;10.26
1970-04-10	I very clean	ˈaɪˈvɛɹiːˈkliːn	aɪ veri kliːn	obs+lat-I	1	2;11.16
1970-04-10	undone these daddy please	ənˈdʌnˈðiːzˈdædiːˈpliːz	ʌndʌn [*] ðiːz dædi pliːz	obs+lat-I	1	2;11.16
1970-04-10	we play inside cause it's raining now	ˈwiːˈpleɪˌɪnˈsaɪdˈkɑzˈɪtsˈɹeɪnɪŋˈnau	wi pleɪ ɪnsaɪd kɒs ɪts reɪnɪŋ naʊ	obs+lat-I	1	2;11.16
1970-07-05	you've got some big glasses well as small ones	ˈjuːvˈgɑtˈsʌmˈbɪgˈglæsəzˈwɛlˈæz ˈsmɒlˈwʌnz	uːv gɒt sʌm bɪg glɑːsɪz wɛl æz smɔːl wʌnz	obs+lat-I	1	3;02.10
1970-07-05	I did blowed it	ˈaɪˈdɪdˈbloudˈɪt	aɪ dɪd bləʊwd [*] ɪt	obs+lat-I	1	3;02.10
1970-07-05	I play play post it	ˈaɪˈpleɪˈpleɪˈpoʊstˈɪt	aɪ pleɪ pleɪ pəʊst ɪt	obs+lat-I	1	3;02.10
1970-07-05	Nicky playing	ˈnɪkiːˈpleɪɪŋ	nɪki pleɪŋ	obs+lat-I	1	3;02.10
1970-07-05	I play play post it	ˈaɪˈpleɪˈpleɪˈpoʊstˈɪt	aɪ pleɪ pleɪ pəʊst ɪt	obs+lat-I	1	3;02.10
1970-08-16	I blowed my kite	ˈaɪˈbloʊdˈmaɪˈkaɪt	aɪ bləʊwd [*] maɪ kaɪt	obs+lat-I	1	3;03.22
1970-08-16	you play it with me	ˈjuːˈpleɪˈɪtˈwɪðˈmiː	ju pleɪ ɪt wɪð mi	obs+lat-I	1	3;03.22
1970-12-05	like that little blob what's on the plate	ˈlaɪkˈðætˈlɪtəlˈblɑbˈwʌtsˈɑnðə ˈpleɪt	laɪk ðæt lɪtʊ blɒb wɒts [*] ɒn ðə pleɪt	obs+lat-I	1	3;07.10
1970-02-28	those are his wings cause he flies	ˈðouzˈɑɹˈhɪzˈwɪŋzˈkɑzˈhiːˈflaɪz	dəʊz ər ɪz wɪŋz kɒz i flaɪz	obs+lat-I	1	3;10.03
1968-11-29	chocolate	ˈʧɒklət	kɑ̈ki	obs+lat-M	3	1;07.04
1969-04-10	chocolate biscuit	ˈʧɒklətˈbɪskət	kɒki [*] bebɛ [*]	obs+lat-M	3	1;11.16

1969-04-10	chocolate biscuit	ˈʧɒklətˈbɪskət	kɒkɪ bɪbɪ	obs+lat-M	3	1;11.16
1969-10-10	that's Chandley's	ˈðætsˈʧændliːz	dæs tɑːndliːz [*]	obs+lat-M	1	2;05.15
1970-03-07	the tablecloth has nearly comed off	ðəˈteɪbəlˌklɒθˈhæzˈnɪɹliːˈɒf	ə teɪbʊklɒð [*] əð [*] nɪəli kʌmd [*] ɒf	obs+lat-M	3	2;10.10
1970-03-07	the tablecloth has nearly comed off	ðəˈteɪbəlˌklɒθˈhæzˈnɪɹliːˈɒf	ə teɪbʊklɒð [*] əð [*] nɪəli kʌmd [*] ɒf	obs+lat-M	1	2;10.10
1968-10-12	brush	ˈbɹʌʃ	ba	obs+rho-I	3	1;05.17
1968-10-31	pram	pɹæm	pæ	obs+rho-I	3	1;06.06
1968-10-31	brush	ˈbɹʌʃ	ba	obs+rho-I	3	1;06.06
1968-11-02	brush	ˈbɹʌʃ	ba	obs+rho-I	3	1;06.08
1968-11-18	train	ˈtɹeɪn	tʰeɪn	obs+rho-I	3	1;06.24
1969-01-03	crocodile	ˈkɹɑkəˌdaɪl	kaka	obs+rho-I	3	1;08.09
1969-01-03	tree	ˈtɹiː	tɹi	obs+rho-I	3	1;08.09
1969-04-10	Jenny's bread	ˈʤɛniːzˈbɹɛd	deːni [*] bɛə	obs+rho-I	3	1;11.16
1969-04-10	Mummy buy grapes	ˈmʌmiːˈbaɪˈgɹeɪps	mʌmi bai geɪ [*]	obs+rho-I	3	1;11.16
1969-04-10	bread	ˈbɹɛd	bɛə	obs+rho-I	3	1;11.16
1969-04-13	prune	ˈpɹuːn	puːn [*]	obs+rho-I	3	1;11.19
1969-04-13	tree there	ˈtɹiːˈðɛɹ	tɹi dɛə	obs+rho-I	3	1;11.19
1969-04-13	yes I like grapes	ˈjesˈaɪˈlaɪkˈgɹeɪps	jeç [*] laɪ geɪp	obs+rho-I	3	1;11.19
1969-04-13	Jenny's dressing gown	ˈʤeniːzˈdɹesɪŋˈgaʊn	dɛni [*] dɛgaʊn [*]	obs+rho-I	3	1;11.19
1969-04-13	grass	ˈgɹæs	gɑː [*]	obs+rho-I	3	1;11.19

1969-04-22	Daddy's crying	ˈdædiːzˈkɹaɪɪŋ	dædɪ kain [*]	obs+rho-I	3	1;11.28
1969-05-03	crying	ˈkɹaɪɪŋ	kaɪn [*]	obs+rho-I	3	2;00.08
1969-05-26	crusts birdies	ˈkɹʌstsˈbʌɹdiːz	kʌ [*] bəːbi	obs+rho-I	3	2;01.01
1969-06-01	birdie crusts	ˈbʌɹdiːˈkɹʌsts	bəːbi [*] kʌ [*]	obs+rho-I	3	2;01.07
1969-06-01	more bread	ˈmɒɹˈbɹɛd	maɪn bɛd [*]	obs+rho-I	3	2;01.07
1969-06-01	more bread	ˈmɒɹˈbɹɛd	mɑ bɛd [*]	obs+rho-I	3	2;01.07
1969-06-16	all broken	ˈɒlˈbɹoʊkən	ɔ beɪbən [*]	obs+rho-I	3	2;01.22
1969-06-21	Lulu's crying	ˈluːˌluːzˈkɹaɪɪŋ	lulu kaɪnɪn	obs+rho-I	3	2;01.27
1969-08-07	frighten mine	ˈfɹaɪtənˈmaɪn	faɪtɪn [*] maɪn	obs+rho-I	3	2;03.13
1969-08-20	Jenny don't like that crust	ˈʤeniːˈdɑntˈlaɪkˈðætˈkɹʌst	dɛni dəun laɪk dæ kʌ [*]	obs+rho-I	3	2;03.26
1969-08-20	throw that to sparrows	ˈθɹoʊˈðætˈtuːˈspɛɹoʊz	fəʊ dæt tə pærəʊz [*]	obs+rho-I	3	2;03.26
1969-08-20	throw that to birdies	ˈθɹoʊˈðætˈtuːˈbʌɹdiːz	fəʊ [*] dæt tə bədiz	obs+rho-I	3	2;03.26
1969-08-20	bring it here	ˈbɹɪŋˈɪtˈhɪɪ	bɪŋ ɪt hɪə	obs+rho-I	3	2;03.26
1969-08-20	like grape	ˈlaɪkˈgɹeɪp	laɪk greɪp	obs+rho-I	1	2;03.26
1969-08-30	Jenny don't like some bread	ˈʤeniːˈdɑntˈlaɪkˈsʌmˈbɹɛd	dɛni dəun laɪk sʌm brɛd	obs+rho-I	1	2;04.05
1969-10-07	going to make a great big Wendy house	ˈgoʊɪŋˈtuːˈmeɪkəˈgɹeɪtˈbɪgˈwɛndiːˈhaʊs	gʊɪn tə meɪk greɪp bɪg wɛndi haʊs	obs+rho-I	1	2;05.12
1969-10-07	there's a green hat	ˈðɛɹzəˈgɹiːnˈhæt	dɛəz ə griːn hæt	obs+rho-I	1	2;05.12
1969-10-10	like cream on it	ˈlaɪkˈkɹiːmˈɑnˈɪt	laɪk kiːm [*] ɒn ɪt	obs+rho-I	3	2;05.15
1969-10-19	my like have a drink of milk	ˈmaɪˈlaɪkˈhævəˈdɹɪŋkˈʌvˈmɪlk	maɪ [*] laɪk hæv ə dɪŋk [*] ə mɪʊk	obs+rho-I	3	2;05.24

1969-10-23	Daddy got a brand new pen	ˈdædiːˈgɑtəˈbɹændˈnuːˈpɛn	dædi gɒt ə bæn [*] nuː pɛn	obs+rho-I	3	2;05.28
1969-11-02	like have that bridge	ˈlaɪkˈhævˈðætˈbɹɪʤ	laɪk hæv dæt bɹɪdð [*]	obs+rho-I	1	2;06.08
1969-11-02	my not drawing on the paper today	ˈmaɪˈnɑtˈdɹɒɪŋˈɑnðəˈpeɪpəɹtəˈdeɪ	maɪ [*] nɒt dɹɔɪn ɒn ə peɪpə tədeɪ	obs+rho-I	1	2;06.08
1969-11-25	cream on the meringues	ˈkɹiːmˈɑnðəˈmɛɹɑŋz	kwiːm [*] ɒn ə wæmz [*]	obs+rho-I	1	2;07.00
1969-12-06	I can draw with that	ˈaɪˈkænˈdɹɒˈwɪðˈðæt	aɪ kæn dɔ [*] wɪð dæt [*]	obs+rho-I	3	2;07.11
1969-12-06	that my new dress	ˈðætˈmaɪˈnuːˈdɹɛs	dæ maɪ nu dɛs [*]	obs+rho-I	3	2;07.11
1969-12-06	me want to draw Daddy	ˈmiːˈwɑntˈtuːˈdɹɒˈdædiː	ma [*] wɒnt tə ðɔ [*] dædi	obs+rho-I	3	2;07.11
1969-12-06	I want to draw Dad	ˈaɪˈwɑntˈtuːˈdɹɒˈdæd	aɪ wɒnt tu ðɔ [*] dæd	obs+rho-I	3	2;07.11
1969-12-06	I didn't scribble	ˈaɪˈdɪdntˈskɹɪbəl	aɪ dɪdn̩ kɪbʊ [*]	obs+rho-I	3	2;07.11
1969-12-06	Daddy going to take it to Grandma's	ˈdædiːˈgoʊɪŋˈtuːˈteɪkˈɪtˈtuːˈgɹæmɑz	dædi gʊɪn tə teɪk ɪt tə græmmɑz	obs+rho-I	1	2;07.11
1969-12-18	have that one to try with	ˈhævˈðætˈwʌnˈtuːˈtɹaɪˈwɪð	hæv [*] ðæt wʌn tə taɪ [*] wɪð	obs+rho-I	3	2;07.23
1969-12-18	I didn't throw the book in the fire	ˈaɪˈdɪdntˈθɹoʊðəˈbʊkənðəˈfaɪəɹ	aɪ dɪdən fəʊ [*] ə bʊk ɪn ə faɪə	obs+rho-I	3	2;07.23
1969-12-18	some people's bringing my daddy home	ˈsʌmˈpiːpəlzˈbɹɪŋɪŋˈmaɪˈdædiː ˈhoʊm	sʌm piːplz [*] bɹɪŋɪŋ maɪ dædi həʊm	obs+rho-I	1	2;07.23
1969-12-18	I want to drive the car	ˈaɪˈwɑntˈtuːˈdɹaɪvðəˈkɑɹ	aɪ wɒnt tu dɹaɪv ə kɑː	obs+rho-I	1	2;07.23
1969-12-18	to christmas	ˈtuːˈkɹɪsməs	tə [*] kɹɪsməs	obs+rho-I	1	2;07.23
1970-01-01	that's scruff	ˈðætsˈskɹʌf	ðæ [*] kʌf [*]	obs+rho-I	-	2;08.07
1970-01-01	that going to dry cleaner	ˈðætˈgoʊɪŋˈtuːˈdɹaɪˈkliːnəɹ	dæ [*] gəʊɪn tə daɪ [*] kiːnə [*]	obs+rho-I	3	2;08.07

1970-01-01	dolly must have a drink of milk	'dɑli:'mʌst'hævə'dɹɪŋk'ʌv'mɪlk	dɒli mʌst hæv ə dɪŋk [*] ə mɪʊk	obs+rho-I	3	2;08.07
1970-01-02	you get it from work	'ju:'gɛt'ɪt'fɹʌm'wʌɹk	u: [*] gɪt ɪt fɒm [*] wə:k	obs+rho-I	3	2;08.08
1970-01-02	I want a green one	'aɪ'wɑntə'gɹi:n'wʌn	aɪ wɒnt ə gri:n wən	obs+rho-I	1	2;08.08
1970-01-02	Lulu drinking all her tea up	'lu:ˌlu:'dɹɪŋkɪŋ'ɒlhəɹ'ti:'ʌp	lulu [*] drɪŋkɪŋ ɔl ə ti: ʌp	obs+rho-I	1	2;08.08
1970-02-12	I want to draw	'aɪ'wɑnt'tu:'dɹɒ	aɪ wɒnt tu dɔ: [*]	obs+rho-I	3	2;09.18
1970-02-12	I want to draw	'aɪ'wɑnt'tu:'dɹɒ	aɪ wɒnt tə dɔ: [*]	obs+rho-I	3	2;09.18
1970-02-12	I doesn't want a spoon to break it all up	'aɪ'dʌznt'wɑntə'spu:n'tu:'bɹeɪk'ɪt 'ɒl'ʌp	a dʌzn [*] wɒnt ə pu:n [*] tə beɪk [*] ɪt ɔl ʌp.	obs+rho-I	3	2;09.18
1970-02-12	Auntie Jack will bring my home	'ænti:'ʤæk'wɪl'bɹɪŋ'maɪ'hoʊm	ɑ:nti dæk [*] wɪl brɪŋ maɪ [*] həʊm	obs+rho-I	1	2;09.18
1970-02-12	my want to draw another one	'maɪ'wɑnt'tu:'dɹɒə'nʌðəɹ'wʌn	maɪ [*] wɒnt tə drɔ: ənʌðə wʌn	obs+rho-I	1	2;09.18
1970-02-16	I play with Daddy's briefcase	'aɪ'pleɪ'wɪð'dædi:z'bɹi:fˌkeɪs	aɪ pleɪ wɪð dædɪz bi:fkeɪs [*]	obs+rho-I	3	2;09.22
1970-02-16	Mummy getting some from the order	'mʌmi:'gɛtɪŋ'sʌm'fɹʌmðə'ɒɹdəɹ	mʌmi [*] gɪtɪŋ sʌm frɒm ə ɔ:də	obs+rho-I	1	2;09.22
1970-02-17	Daddy wants some more bread to go to work tomorrow	Daddy wants some more bread to go to work tomorrow	dædi wɒnts sʌm mo: brɛd tə gəʊ tə wə:k təmɒrəʊ [*]	obs+rho-I	1	2;09.23
1970-02-28	want a drink of water	'wɑntə'dɹɪŋk'ʌv'wɒtəɹ	wɒnt ə drɪŋk ə wɔ:tə	obs+rho-I	1	2;10.03
1970-03-07	I will draw	'aɪ'wɪl'dɹɒ	aɪ wɪʊ [*] dɔ: [*]	obs+rho-I	3	2;10.10
1970-03-07	that one's broken	'ðæt'wʌnz'bɹoʊkən	ðæt wʌnz brəʊkən	obs+rho-I	1	2;10.10
1970-03-07	I had that Christmas card	'aɪ'hæd'ðæt'kɹɪsməs'kɑɹd	aɪ hæd ðæt krɪmə [*] kɑ:d	obs+rho-I	1	2;10.10

1970-03-07	these are Christmas cards	ˈðiːzˈɑɹˈkɹɪsməsˈkɑɪdz	ðiːð [*] ə kɹɪsməs kɑːdz	obs+rho-I	1	2;10.10
1970-03-07	you don't scribble	ˈjuːˈdɑntˈskɹɪbəl	u [*] dəun kɹɪbʊ [*]	obs+rho-I	1	2;10.10
1970-03-23	can I have some Christmas cards	ˈkænˈaɪˈhævˈsʌmˈkɹɪsməsˈkɑɪdz	kæn aɪ hæv sʌm kɹɪsməs kɑːdz	obs+rho-I	1	2;10.26
1970-03-23	I can draw teddy bear	ˈaɪˈkænˈdɹɒˈtɛdiːˈbɛɹ	aɪ kæn drɔ tɛdi bɛə	obs+rho-I	1	2;10.26
1970-03-23	this is a pretty for my birthday	ˈðɪsˈɪzəˈpɹɪtiːˈfɒɹˈmaɪˈbʌɪθˌdeɪ	ðɪs ɪz ə pɹɪti fɔ maɪ bəːədeɪ	obs+rho-I	1	2;10.26
1970-04-10	you promised me a lolly when my come back from Sunday school	ˈjuːˈpɹɑməstˈmiːəˈlɑliːˈwɛnˈmaɪ ˈkʌmˈbækˈfɪʌmˈsʌnˌdeɪˈskuːl	u pɹɒmɪ [*] mi ə lɒli wɛm maɪ [*] kʌm [*] bæk fɹɒm sʌndeɪ kuːl [*]	obs+rho-I	1	2;11.16
1970-04-10	I will cry if you go out	ˈaɪˈwɪlˈkɹaɪˈɪfˈjuːˈgoʊˈaʊt	aɪ wɪʊ kɹaɪ ɪf u gəʊ aʊt	obs+rho-I	1	2;11.16
1970-04-10	you promised me a lolly when my come back from Sunday school	ˈjuːˈpɹɑməstˈmiːəˈlɑliːˈwɛnˈmaɪ ˈkʌmˈbækˈfɪʌmˈsʌnˌdeɪˈskuːl	u pɹɒmɪ [*] mi ə lɒli wɛm maɪ [*] kʌm [*] bæk fɹɒm sʌndeɪ kuːl [*]	obs+rho-I	1	2;11.16
1970-04-25	I tried one of Lulu's	ˈaɪˈtɹaɪdˈwʌnˈʌvˈluːˌluːz	a tɹaːd wʌn ɒv luluz	obs+rho-I	1	3;00.00
1970-07-05	I going to have a big pram like Lisa's pram	ˈaɪˈgoʊɪŋˈtuːˈhævəˈbɪgˈlaɪkˈliːsəz ˈpɹæm	aɪ gəʊɪŋ tə hæv ə bɪg pɹæm laɪk lisəz pɹæm.	obs+rho-I	1	3;02.10
1970-07-05	I going to have a big pram like Lisa's pram	ˈaɪˈgoʊɪŋˈtuːˈhævəˈbɪgˈlaɪkˈliːsəz ˈpɹæm	aɪ gəʊɪŋ tə hæv ə bɪg pɹæm laɪk lisəz pɹæm.	obs+rho-I	1	3;02.10
1970-08-16	I going to drink it now	ˈaɪˈgoʊɪŋˈtuːˈdɹɪŋkˈɪtˈnaʊ	aɪ gəʊɪŋ tə dɹɪŋk ɪt naʊ	obs+rho-I	1	3;03.22
1970-08-16	oo it dropped the lid	uːˈɪtˈdɹɑptðəˈlɪd	uː ɪt dɹɒpt ðə lɪd	obs+rho-I	1	3;03.22
1970-09-08	I want Mac to bring me	ˈaɪˈwɑntˈmækˈtuːˈbɹɪŋˈmiː	aɪ wɒnt mæk tə bɹɪŋ [*] mi	obs+rho-I	1	3;04.14

1970-12-05	I didn't know what day the string came off didn't you	ˈaɪˈdɪdntˈnoʊˈwʌtˈdeɪðəˈstɹɪŋˈkeɪm ˈɒfˈjuː	aɪ dɪdn nəʊ wɒt deɪ ðə stɹɪŋ keɪm ɒf dɪdnt [*] ju.	obs+rho-I	-	3;07.10
1970-12-26	how many were the crisps	ˈhaʊˈmɛniːwəɹðəˈkɹɪsps	haʊ mɛni [*] wəː də kɹɪps [*]	obs+rho-I	1	3;08.17
1969-04-13	umbrella	əmˈbɹɛlə	ʌməbɛlə	obs+rho-M	3	1;11.19
1969-04-13	umbrella	əmˈbɹɛlə	bɛlə	obs+rho-M	3	1;11.19
1969-10-10	all across there	ˈɒləˈkɹɒsˈðɛɹ	ɔ kɹɒ [*] dɛə	obs+rho-M	1	2;05.15
1969-10-17	dolly coming Cambridge	ˈdɑliːˈkʌmɪŋˈkeɪmbɹɪʤ	dɒli kʌmɪn keɪmbɪð [*]	obs+rho-M	3	2;05.22
1969-10-17	it's a long way to Cambridge	ˈɪtsəˈlɒŋˈweɪˈtuːˈkeɪmbɹɪʤ	ɪts ə lɒŋ weɪ tə keɪmbɪð [*]	obs+rho-M	3	2;05.22
1969-10-17	we going to Cambridge	ˈwiːˈgoʊɪŋˈtuːˈkeɪmbɹɪʤ	wi gʊɪn tə keɪmbɹɪð [*]	obs+rho-M	1	2;05.22
1969-10-17	Barbara's hungry	ˈbɑɹbəɹəzˈhʌŋgɹiː	bɑːbrəz hʌŋgri	obs+rho-M	1	2;05.22
1970-01-01	don't go across it	ˈdɑntˈgoʊəˈkɹɒsˈɪt	dəʊnt gəʊ kɹɒs [*] ɪt	obs+rho-M	1	2;08.07
1970-02-12	I doesn't want a pastry	ˈaɪˈdʌzntˈwɑntəˈpeɪstɹiː	a dʌzn [*] wɒn ə peːti [*]	obs+rho-M	3	2;09.18
1970-02-12	all the children's sick already	ˈɒlðəˈʧɪldɹənzˈsɪkɒlˈɹɛdiː	ɔl ə ʧɪldrənz [*] sɪk ɔrɛdi [*]	obs+rho-M	1	2;09.18
1970-08-16	I'll choose them to everybody	ˈaɪɬˈʧuːzˈðɛmˈtuːˈɛvɹiːˌbɑdiː	aɪl ʧuːz ðɛm tu [*] ɛvɹibɒdi	obs+rho-M	1	3;03.22
1968-12-27	sweetie	ˈswiːtiː	pʰipʰi	s+gli-I	5	1;08.02
1969-04-13	swimming	ˈswɪmɪŋ	s̪ɪmɪn [*]	s+gli-I	3	1;11.19
1969-04-13	swimming	ˈswɪmɪŋ	fimɪn [*]	s+gli-I	5	1;11.19
1969-04-13	swimming	ˈswɪmɪŋ	pʰɪmɪn [*]	s+gli-I	5	1;11.19
1969-04-13	sweetie	ˈswiːtiː	piːpiː [*]	s+gli-I	5	1;11.19
1969-05-05	sweetie cough	ˈswiːtiːˈkɑf	pɪpɪ [*] kɒ	s+gli-I	5	2;00.10
1969-06-16	swan	ˈswɑn	fɒm	s+gli-I	5	2;01.22

1969-08-30	going my swimming baths	ˈgoʊɪŋˈmaɪˈswɪmɪŋˈbæθs	gʊɪn maɪ fɪmɪn [*] bɑə [*]	s+gli-I	5	2;04.05
1969-09-13	Lulu wont touch my little sweetie	ˈluːˌluːˈwoʊntˈtʌʧˈmaɪˈlɪtəlˈswiːtiː	lulu wəʊn tʌ [*] maɪ lɪtʊ fiːti [*]	s+gli-I	5	2;04.19
1969-11-25	policeman going swimming	pəˈliːsmənˈgoʊɪŋˈswɪmɪŋ	pliːəmæn [*] gʊɪn swɪmɪn	s+gli-I	1	2;07.00
1969-12-18	can I have a sweetie now	ˈkænˈaɪˈhævəˈswiːtiːˈnaʊ	kæn ɑ hæv ə swiːti naʊ	s+gli-I	1	2;07.23
1969-12-18	me want sweeties	ˈmiːˈwɑntˈswiːtiːz	mɑ [*] wɒnt swiːtiːz	s+gli-I	1	2;07.23
1970-02-01	where's a sweetie	ˈwɛɹzəˈswiːtiː	wɛəz ə swiːti	s+gli-I	1	2;09.07
1970-08-16	I like the swings the roundabout and the seesaw	ˈaɪˈlaɪkðəˈswɪŋzðəˈɹaʊndəˌbaʊt ˈændðəˈsiːˌsɒ	aɪ laɪk ðə swɪŋz ðə raʊndəbɑʊt n ðə sisɔ	s+gli-I	1	3;03.22
1970-12-26	tell Daddy not to switch the landing light off every time he comes up	ˈtɛlˈdædiːˈnɑtˈtuːˈswɪʧðəˈlændɪŋ ˈlaɪtˈɒfˈɛvəɹiːˈtaɪmˈhiːˈkʌmzˈʌp	tɛl dædi nɒt tə swɪtʃ ðə lændɪn laɪt ɒf ɛvə [*] taɪm hi kʌmz ʌp.	s+gli-I	1	3;08.01
1969-10-10	going to sleep in a minute	ˈgoʊɪŋˈtuːˈsliːpənəˈmɪnət	gʊɪŋ tə fiːp [*] ɪn ə mɪnɪt	s+lat-I	5	2;05.15
1969-10-17	teddy going to sleep	ˈtɛdiːˈgoʊɪŋˈtuːˈsliːp	tɛdi gwɪn tə fiːp [*]	s+lat-I	5	2;05.22
1969-10-17	baby to sleep	ˈbeɪbiːˈtuːˈsliːp	beɪbi tə sliːp	s+lat-I	1	2;05.22
1969-10-17	like to put those shoes to sleep	ˈlaɪkˈtuːˈpʊtˈðoʊzˈʃuːzˈtuːˈsliːp	laɪk ə pʊt dəʊz ʃuːz tə sliːp	s+lat-I	1	2;05.22
1969-12-18	Lulu's not sleepy	ˈluːˌluːzˈnɑtˈsliːpiː	luluz nɒt siːpiː [*]	s+lat-I	3	2;07.23
1969-12-31	my putting my slippers on	ˈmaɪˈpʌtɪŋˈmaɪˈslɪpəɹzˈɑn	maɪ [*] pʊtɪŋ maɪ slɪpəz ɒn	s+lat-I	1	2;08.06
1970-03-23	I thought you was asleep	ˈaɪˈθɒtˈjuːˈwɑzəˈsliːp	aɪ əɔt uː wɒz [*] əsliːp	s+lat-M	1	2;10.26
1969-08-20	Jenny's got Smarties	ˈʤeniːzˈgɑtˈsmɑɹtiːz	dɛni gɒ faːtiz [*]	s+nas-I	5	2;03.26
1969-08-20	don't like Smarties	ˈdɑntˈlaɪkˈsmɑɹtiːz	dəʊn laɪk fɑːti [*]	s+nas-I	5	2;03.26

1969-08-20	Lulu's Smartie box in here	ˈluːˌluːzˈsmɑɹtiːˈbɑksənˈhɪɹ	luluz fɑːti bɒks ɪn hɪə	s+nas-I	5	2;03.26
1970-01-01	can smack you again	ˈkænˈsmækˈjuːəˈgɛn	kæn [*] smæk u əgɛn	s+nas-I	1	2;08.07
1970-02-12	I want a small one	ˈaɪˈwɑntəˈsmɒlˈwʌn	aɪ wɒnt ə mɔːl [*] wʌn	s+nas-I	2	2;09.18
1970-02-12	my want one smaller boot	ˈmaɪˈwɑntˈwʌnˈsmɒləɹˈbuːt	maɪ [*] wɒnt wʌn [*] smɔːlə buːt	s+nas-I	1	2;09.18
1970-03-15	that's snow	ˈðætsˈsnoʊ	ðæ [*] n̩əʊ [*]	s+nas-I	2	2;10.10
1970-07-05	you've got some big glasses well as small ones	ˈjuːvˈgɑtˈsʌmˈbɪgˈglæsəzˈwɛlˈæz ˈsmɒlˈwʌnz	uːv gɒt sʌm bɪg glɑːsɪz wɛl æz smɔːl wʌnz	s+nas-I	1	3;02.10
1969-11-25	policeman going swimming	pəˈliːsmənˈgoʊɪŋˈswɪmɪŋ	pliːəmæn [*] guɪn swɪmɪn	s+nasM	1	2;07.00
1969-12-18	to christmas	ˈtuːˈkɹɪsməs	tə [*] kɹɪsməs	s+nasM	1	2;07.23
1970-03-07	I had that Christmas card	ˈaɪˈhædˈðætˈkɹɪsməsˈkɑɹd	aɪ hæd ðæt kɹɪməə [*] kɑːd	s+nasM	2	2;10.10
1970-03-07	these are Christmas cards	ˈðiːzˈɑɹˈkɹɪsməsˈkɑɹdz	ðiːð [*] ə kɹɪsməs kɑːdz	s+nasM	1	2;10.10
1970-03-23	can I have some Christmas cards	ˈkænˈaɪˈhævˈsʌmˈkɹɪsməsˈkɑɹdz	kæn aɪ hæv sʌm kɹɪsməs kɑːdz	s+nasM	1	2;10.26
1968-12-27	toast	ˈtoʊst	təʊ	s+obs-F	4	1;08.02
1969-03-19	birdie toast	ˈbʌɹdiːˈtoʊst	bəːbi [*] təʊ	s+obs-F	4	1;10.22
1969-04-27	more toast	ˈmɒɹˈtoʊst	mɑː təʊ	s+obs-F	4	2;00.02
1969-05-26	crusts birdies	ˈkɹʌstsˈbʌɹdiːz	kʌ [*] bəːbi	s+obs-F	4	2;01.01
1969-06-01	toast's gone	ˈtoʊstsˈgɒn	təʊtəʊ gɒn	s+obs-F	4	2;01.07
1969-07-02	just like that	ˈʤʌstˈlaɪkˈðæt	gɪ laɪ da	s+obs-F	4	2;02.07
1969-08-20	butter toast now	ˈbʌtəɹˈtoʊstˈnaʊ	bʌtə təʊ [*] naʊ	s+obs-F	4	2;03.26

1969-08-20	Jenny don't like that crust	ˈʤɛniːˈdɑntˈlaɪkˈðætˈkɹʌst	dɛni dəun laɪk dæ kʌ [*]	s+obs-F	4	2;03.26
1969-08-20	toast's coming	ˈtoʊstsˈkʌmɪŋ	təʊtɪt [*] kʌmɪn	s+obs-F	2	2;03.26
1969-08-30	Mummy there first	ˈmʌmiːˈðɛɹˈfʌɪst	mʌmi dɛə fəːs	s+obs-F	3	2;04.05
1969-08-30	just a little bit	ˈʤʌstəˈlɪtəlˈbɪt	dʒʌs ə lɪtʊ bɪt	s+obs-F	3	2;04.05
1969-08-30	those are wasps	ˈðoʊzˈɑɹˈwɑsps	dəʊd [*] ə wɒpi [*]	s+obs-F	2	2;04.05
1969-10-07	toast burning	ˈtoʊstˈbʌɪnɪŋ	təʊs bəːnɪŋ	s+obs-F	3	2;05.12
1969-10-07	toast is burning	ˈtoʊstˈɪzˈbʌɪnɪŋ	təʊs ɪz bəːnɪŋ	s+obs-F	3	2;05.12
1969-10-10	don't go too fast	ˈdɑntˈgoʊˈtuːˈfæst	dəʊn gəʊ tʊ fɑ	s+obs-F	4	2;05.15
1969-10-10	Mummy make more toast for me	ˈmʌmiːˈmeɪkˈmoɹˈtoʊstˈfoɹˈmiː	mʌmi meɪk mɔ təʊs fɔ mi	s+obs-F	3	2;05.15
1969-10-10	no finished my toast	ˈnoʊˈfɪnɪʃtˈmaɪˈtoʊst	nəʊ fɪnɪs maɪ təʊs	s+obs-F	3	2;05.15
1969-12-18	my doesn't finish my toast	ˈmaɪˈdʌznt ˈfɪnɪʃˈmaɪˈtoʊst	maɪ [*] <dʌzn fɪnɪs> [*] maɪ təʊs	s+obs-F	3	2;07.23
1969-12-18	can I post the letter dad	ˈkænˈaɪˈpoʊstðəˈlɛtəɹˈdæd	kæn aɪ pəʊt [*] ə letə dæd	s+obs-F	2	2;07.23
1970-01-01	dolly must have a drink of milk	ˈdɑliːˈmʌstˈhævəˈdɹɪŋkˈʌvˈmɪlk	dɒli mʌst hæv ə dɪŋk [*] ə mɪʊk	s+obs-F	1	2;08.07
1970-01-02	next week my have it	ˈnɛkstˈwiːkˈmaɪˈhævˈɪt	nɛ [*] wiːk maɪ [*] hæv ɪt	s+obs-F	4	2;08.08
1970-02-12	Mummy must buy some bananas	ˈmʌmiːˈmʌstˈbaɪˈsʌmbəˈnænəz	mʌmi mʌs baɪ sʌm nɑːnəz [*]	s+obs-F	3	2;09.18
1970-04-10	you went out last time	ˈjuːˈwɛntˈaʊtˈlæstˈtaɪm	u [*] wɛnt aʊt lɑð [*] taɪm	s+obs-F	3	2;11.16
1970-07-05	I play play post it	ˈaɪˈpleɪˈpleɪˈpoʊstˈɪt	aɪ pleɪ pleɪ pəʊst ɪt	s+obs-F	1	3;02.10
1970-12-26	how many were the crisps	ˈhaʊˈmɛniːwəɹðəˈkɹɪsps	haʊ mɛni [*] wəː də krɪps [*]	s+obs-F	2	3;08.01

1968-10-15	spoon	ˈspuːn	pʊ	s+obs-I	2	1;05.20
1968-11-29	spoon	ˈspuːn	buː	s+obs-I	2	1;07.04
1968-11-29	spoon	ˈspuːn	bʊ	s+obs-I	2	1;07.04
1968-12-20	story	ˈstɒɹiː	dəːwi	s+obs-I	2	1;07.25
1968-12-20	spoon	ˈspuːn	buːn	s+obs-I	2	1;07.25
1969-05-04	spider	ˈspaɪdəɹ	$p^{h}aɪp^{h}ə$ [*]	s+obs-I	2	2;00.09
1969-05-05	spoon	ˈspuːn	buːn [*]	s+obs-I	2	2;00.10
1969-05-26	starling	ˈstɑɹlɪŋ	tɑːlɪn [*]	s+obs-I	2	2;01.01
1969-08-20	going to school	ˈgoʊɪŋˈtuːˈskuːl	guːɪŋ tə kuːl [*]	s+obs-I	2	2;03.26
1969-08-20	Lulu's not going to school	ˈluːˌluːzˈnɑtˈgoʊɪŋˈtuːˈskuːl	luluz nɒ guːwɪŋ tə kuːl [*]	s+obs-I	2	2;03.26
1969-08-20	throw that to sparrows	ˈθɹoʊˈðætˈtuːˈspɛɹoʊz	fəʊ dæt tə pærəʊz [*]	s+obs-I	2	2;03.26
1969-08-30	Daddy's going to Stockport	ˈdædiːzˈgoʊɪŋˈtuːˈstɑkpɒɹt	dædi guwɪn tɒkpɔːt	s+obs-I	2	2;04.05
1969-09-13	got a story book	ˈgɑtəˈstɒɹiːˈbʊk	gɒt ə tɔri [*] bʊk	s+obs-I	2	2;04.19
1969-10-07	stuck again	ˈstʌkəˈgɛn	tʌk [*] əgɛɪn	s+obs-I	2	2;05.12
1969-11-25	Lulu fall on the stairs	ˈluːˌluːˈfɑlˈɑnðəˈsteɹz	lulu fɔl ɒn ə teə [*]	s+obs-I	2	2;07.00
1969-12-06	I didn't scribble	ˈaɪˈdɪdntˈskɹɪbəl	aɪ dɪdn̩ kɪbʊ [*]	s+obs-I	-	2;07.11
1969-12-18	on the stool	ˈɑnðəˈstuːl	ɒn ə tuːl [*]	s+obs-I	2	2;07.23
1969-12-18	mummy take me to Sunday school	ˈmʌmiːˈteɪkˈmiːˈtuːˈsʌnˌdeɪˈskuːl	mʌmi teɪk maɪ [*] tə sʌndeɪ skuːl	s+obs-I	1	2;07.23
1970-01-01	that's scruff	ˈðætsˈskɹʌf	ðæ [*] kʌf [*]	s+obs-I	-	2;08.07
1970-01-01	that's scruff	ˈðætsˈskɹʌf	ðæ [*] kʌf [*]	s+obs-I	-	2;08.07

1970-01-11	we going to Sunday school now	'wi:'gouɪŋ'tu:'sʌn¸deɪ'sku:l'naʊ	wi gəʊɪn tə ʃʌndeɪ ku:l [*] naʊ	s+obs-I	2	2;08.17
1970-01-11	can I play those when I come back to Sunday school	'kæn'aɪ'pleɪ'ðoʊz'wɛn'aɪ'kʌm 'bæk'tu:'sʌn¸deɪ'sku:l	kæn aɪ pleɪ ðəʊz [*] wɛn aɪ kʌm bæk tə [*] sʌndeɪ sku:l.	s+obs-I	1	2;08.17
1970-02-12	Mummy won't go to night school	'mʌmi:'woʊnt'goʊ'tu:'naɪt'sku:l	mʌmi wəʊn gəʊ tə naɪt ku:l [*]	s+obs-I	2	2;09.18
1970-02-12	we going to Sunday school	'wi:'gouɪŋ'tu:'sʌn¸deɪ'sku:l	wi [*] gəʊɪn tə sʌndeɪ ku:l [*]	s+obs-I	2	2;09.18
1970-02-12	I doesn't want a spoon to break it all up	'aɪ'dʌznt'wɑntə'spu:n'tu:'bɹeɪk'ɪt 'ɒl'ʌp	a dʌzn [*] wɒnt ə pu:n [*] tə beɪk [*] ɪt ɔl ʌp.	s+obs-I	2	2;09.18
1970-02-12	you go to night school today	'ju:'goʊ'tu:'naɪt'sku:ltə'deɪ	u: gəʊ tə naɪt ku:l [*] tədeɪ	s+obs-I	2	2;09.18
1970-02-16	take a one story upstairs	'teɪkə'wʌn'stɒɹi:əp'steɪz	teɪk ə wʌn tɔ:ri [*] ʌpteəz [*]	s+obs-I	2	2;09.22
1970-03-07	you don't scribble	'ju:'dɑnt'skɪɪbəl	u [*] dəʊn kɹɪbʊ [*]	s+obs-I	-	2;10.10
1970-03-07	it is skipping	'ɪt'ɪz'skɪpɪŋ	ɪt ɪz kɪpɪn [*]	s+obs-I	2	2;10.10
1970-03-07	we will have shoes on to go Sunday school	'wi:'wɪl'hæv'ʃu:z'ɑn'tu:'goʊ'sʌn ¸deɪ'sku:l	wi wɪʊ [*] hæv ðu:z [*] ɒn tə gəʊ sʌndeɪ ku:l [*]	s+obs-I	2	2;10.10
1970-03-15	I want a pony tail to Sunday school	'aɪ'wɑntə'poʊni:'teɪl'tu:'sʌn¸deɪ 'sku:l	a wɒnt ə pəʊni teɪl tə [*] sʌndeɪ ku:l [*]	s+obs-I	2	2;10.18
1970-03-23	I learning to skip	'aɪ'lʌɪnɪŋ'tu:'skɪp	aɪ lə:nɪŋ tə kɪp [*]	s+obs-I	2	2;10.26
1970-03-23	there's a blue sky Lulu	'ðɛɹzə'blu:'skaɪ'lu:¸lu:	ðɛəz ə blu: kaɪ [*] lulu	s+obs-I	2	2;10.26
1970-03-23	this is the sky	'ðɪs'ɪzðə'skaɪ	ðɪs ɪz ðə kaɪ [*]	s+obs-I	2	2;10.26
1970-03-23	stay on the pavement Steven	'steɪ'ɑnðə'peɪvmənt'sti:vən	teɪ [*] ɒn ə peɪvmənt ti:vi [*]	s+obs-I	2	2;10.26
1970-03-23	stay on the pavement Steven	'steɪ'ɑnðə'peɪvmənt'sti:vən	teɪ [*] ɒn ə peɪvmənt ti:vi [*]	s+obs-I	2	2;10.26

1970-04-02	tomorrow's Sunday school today	təˈmɑˌɹoʊzˈsʌnˌdeɪˈskuːltəˈdeɪ	təmɒrəʊz sʌndeɪ kuːl [*] tədeɪ	s+obs-I	2	2;11.08
1970-04-10	you promised me a lolly when my come back from Sunday school	ˈjuːˈpɹɑməstˈmiːəˈlɑliːˈwɛnˈmaɪ ˈkʌmˈbækˈfɹʌmˈsʌnˌdeɪˈskuːl	u prɒmɪ [*] mi ə lɒli wɛm maɪ [*] kʌm [*] bæk frɒm sʌndeɪ kuːl [*]	s+obs-I	2	2;11.16
1970-04-10	it will stay in my bib now	ˈɪtˈwɪlˈsteɪənˈmaɪˈbɪbˈnaʊ	ɪt wɪʊ steɪ ɪm maɪ bɪb naʊ	s+obs-I	1	2;11.16
1970-08-16	I got a school bag	ˈaɪˈgɑtəˈskuːlˈbæg	aɪ gɒt ə kuːl [*] bæg	s+obs-I	2	3;03.22
1970-12-05	I didn't know what day the string came off didn't you	ˈaɪˈdɪdntˈnoʊˈwʌtˈdeɪðəˈstɹɪŋˈkeɪm ˈɒfˈjuː	aɪ dɪdn nəʊ wɒt deɪ ðə strɪŋ keɪm ɒf dɪdnt [*] ju.	s+obs-I	-	3;07.10
1969-04-10	biscuit like	ˈbɪskətˈlaɪk	bɪskɪt laɪk	s+obs-M	1	1;11.16
1969-05-05	upstairs	əpˈstɛɹz	ba dɛə	s+obs-M	2	2;00.10
1969-08-07	supper time downstairs	ˈsʌpəɹˈtaɪmˌdaʊnˈstɛɹz	pʌpə [*] taɪm daʊntɛəz	s+obs-M	2	2;03.13
1969-08-07	squirrel's downstairs too	ˈskwʌɹəlzˌdaʊnˈstɛɹzˈtuː	kɪru daʊndeə [*] tuː	s+obs-M	2	2;03.13
1969-08-30	to Manchester	ˈtuːˈmænˌʧɛstəɹ	tə mæncɪtə [*]	s+obs-M	2	2;04.05
1969-08-30	mine's got a rosebud	ˈmaɪnzˈgɑtəˈɹoʊzbəd	maɪnz gɒt ə rəʊzbəd	s+obs-M	1	2;04.05
1969-09-13	Mummy gone upstairs	ˈmʌmiːˈgɒnəpˈstɛɹz	mʌmi gɒn ʌptɛəz [*]	s+obs-M	2	2;04.19
1969-10-19	take my basket	ˈteɪkˈmaɪˈbæskət	teɪk maɪ bɑːkɪt [*]	s+obs-M	2	2;05.24
1969-11-02	elastic	əˈlæstɪk	lætɪk [*]	s+obs-M	2	2;06.08
1969-11-08	don't go upstairs	ˈdɑntˈgoʊəpˈstɛɹz	dəʊn gəʊ ʌptɛəz [*]	s+obs-M	2	2;06.14
1969-12-06	my go upstairs another day	ˈmaɪˈgoʊəpˈsteɪɹzəˈnʌðəɹˈdeɪ	maɪ [*] gəʊ ʌptɛə [*] nʌdə deɪ	s+obs-M	2	2;07.11
1969-12-18	that can go in the basket	ˈðætˈkænˈgoʊənðəˈbæskət	dæ mukaʊ kæn gəʊ ɪn ə bɑːskɪt	s+obs-M	1	2;07.23

1970-01-01	I want a bit of plaster	ˈaɪˈwɑntəˈbɪtˈʌvˈplæstəɹ	aɪ wɒnt ə bɪt ə pɑːtə [*]	s+obs-M	2	2;08.07
1970-01-11	downstairs	ˌdaʊnˈsteɪz	daʊnteəð [*]	s+obs-M	2	2;08.17
1970-02-12	I doesn't want a pastry	ˈaɪˈdʌzntˈwɑntəˈpeɪstɹiː	a dʌzn [*] wɒn ə peːti [*]	s+obs-M	2	2;09.18
1970-02-16	take a one story upstairs	ˈteɪkəˈwʌnˈstɒɹiːəpˈsteɪz	teɪk ə wʌn tɔːri [*] ʌpteəz [*]	s+obs-M	2	2;09.22
1970-07-05	hospital	ˈhɑsˌpɪtəl	hɒpətəl [*]	s+obs-M	2	3;02.10

Lucy

Date	Orthography	IPATarget	IPAActual	ClusterType	Real	Age
1968-10-23	flower	ˈflaʊəɹ	pɑʊə	obs+lat-I	3	1;05.28
1969-04-07	Daddy's glasses	ˈdædiːzˈglæsəz	dædɪz gɑːgɪz [*]	obs+lat-I	3	1;11.13
1969-04-07	Daddy's glasses	ˈdædiːzˈglæsəz	dædɪz gɑːsɪz	obs+lat-I	3	1;11.13
1969-04-10	blue tit	ˈbluːˈtɪt	buː tɪt	obs+lat-I	3	1;11.16
1969-04-10	blue tits	ˈbluːˈtɪts	bu [*] tɪts	obs+lat-I	3	1;11.16
1969-04-10	blue tit	ˈbluːˈtɪt	bu tɪt	obs+lat-I	3	1;11.16
1969-04-10	biscuit please	ˈbɪskətˈpliːz	bɪskɪt piːs [*]	obs+lat-I	3	1;11.16
1969-04-13	please	ˈpliːz	piːs [*]	obs+lat-I	3	1;11.19
1969-04-13	on the floor	ˈɑnðəˈflɒɹ	ɒn ðə fɔə [*]	obs+lat-I	3	1;11.19
1969-04-13	crumbs on the floor	ˈkɹʌmzˈɑnðəˈflɒɹ	kʌmz fɔ	obs+lat-I	3	1;11.19
1969-04-13	clip in hair	ˈklɪpənˈhɛɹ	klɪp ɪn hɛə	obs+lat-I	1	1;11.19
1969-04-22	no playing	ˈnoʊˈpleɪɪŋ	nɒ peɪn [*]	obs+lat-I	3	1;11.28
1969-04-22	climb over	ˈklaɪmˈoʊvəɹ	kaɪm bəuvə	obs+lat-I	3	1;11.28
1969-04-27	clean nappy	ˈkliːnˈnæpi	kiːn [*] næpi	obs+lat-I	3	2;00.02
1969-05-05	blue tit gone	ˈbluːˈtɪtˈgɒn	buː [*] tɪt gɒn	obs+lat-I	3	2;00.10
1969-05-05	teddy fly	ˈtɛdiːˈflaɪ	tɛdi faɪ [*]	obs+lat-I	3	2;00.10
1969-05-05	on the floor	ˈɑnðəˈflɒɹ	ɒn də dɔː [*]	obs+lat-I	3	2;00.10
1969-05-05	another fly	əˈnʌðəɹˈflaɪ	lɛləʊ faɪ	obs+lat-I	3	2;00.10
1969-05-13	get a flannel	ˈgɛtəˈflænəl	gɪt ə fænuː [*]	obs+lat-I	3	2;00.18
1969-05-24	clean plate	ˈkliːnˈpleɪt	kiːn [*] peɪt [*]	obs+lat-I	3	2;00.29

1969-05-24	clean plate	ˈkliːnˈpleɪt	kiːn [*] peɪt [*]	obs+lat-I	3	2;00.29
1969-05-26	go away fly	ˈgoʊəwˈweɪˈflaɪ	gəʊ weɪ faɪ	obs+lat-I	3	2;01.01
1969-05-26	fly	ˈflaɪ	pʰaɪ [*]	obs+lat-I	3	2;01.01
1969-06-01	clean them	ˈkliːnˈðɛm	kiːn [*] əmz	obs+lat-I	3	2;01.07
1969-07-02	gone on the floor	ˈgɒnˈɑnðəˈflɒɹ	gɒn ɒn ə fɔ [*]	obs+lat-I	3	2;02.07
1969-08-07	got a blanket	ˈgɑtəˈblæŋkət	gɒt ə blæŋkɪt	obs+lat-I	1	2;03.13
1969-08-20	another one's down the floor	əˈnʌðəɹˈwʌnzˈdaʊnðəˈflɒɹ	nʌdə [*] wʌnz daʊn ə fɔ [*]	obs+lat-I	3	2;03.26
1969-08-20	there's a fly	ˈðɛɹzəˈflaɪ	dɛəz ə faɪ [*]	obs+lat-I	3	2;03.26
1969-08-20	that's all clean	ˈðætsˈɒlˈkliːn	dæs ɔ kliːn	obs+lat-I	1	2;03.26
1969-08-20	it's not past eight o'clock	ˈɪtsˈnɑtˈpæstˈeɪtˈoʊˈklɑk	ɪts nɒt plɑːst [*] eɪt əklɒk	obs+lat-I	1	2;03.26
1969-08-20	like it on a plate	ˈlaɪkˈɪtˈɑnəˈpleɪt	laɪk ɪt ɒn ə pleɪt	obs+lat-I	1	2;03.26
1969-08-20	make it all clean too	ˈmeɪkˈɪtˈɒlˈkliːnˈtuː	meɪk ɪt ɔ kliːn tuː	obs+lat-I	1	2;03.26
1969-08-30	flies don't come	ˈflaɪzˈdɑntˈkʌm	flaɪz dəʊn kʌm	obs+lat-I	1	2;04.05
1969-09-21	Mummy's got blue eyes	ˈmʌmiːzˈgɑtˈbluːˈaɪz	mʌmiz gɒt bluː aɪz	obs+lat-I	1	2;04.27
1969-10-07	mine's not to blow on it again	ˈmaɪnsˈnɑtˈtuːˈbloʊˈɑnˈɪtəˈgɛn	maɪnz nɒt tə bləʊ ɒn ɪt əgeɪn	obs+lat-I	1	2;05.12
1969-11-08	that's not dolly's blanket	ˈðætsˈnɑtˈdɑliːzˈblæŋkət	ðæts nɒt dɒlɪz blæŋkɪt	obs+lat-I	1	2;06.14
1969-11-19	my like one plate	ˈmaɪˈlaɪkˈwʌnˈpleɪt	maɪ laɪk wʌn pleɪt	obs+lat-I	1	2;06.25
1969-12-18	all the clothes are out	ˈɒlðəˈkloʊðzˈɑɹˈaʊt	ɔl ə kləʊz ə ɑʊt	obs+lat-I	1	2;07.23
1969-12-18	they flewed	ˈðeɪˈfluːˈəd	ðeɪ fluːd [*]	obs+lat-I	1	2;07.23
1969-12-18	Daddy's blowing it	ˈdædiːzˈbloʊŋˈɪt	dædɪz bləʊwɪn ɪt	obs+lat-I	1	2;07.23

1969-12-18	Mummy bringing my clothes down	ˈmʌmiːˈbɪŋɪŋˈmaɪˈkloʊðzˈdaʊn	mʌmi bɪŋɪŋ [*] maɪ kləʊz daʊn	obs+lat-I	1	2;07.23
1969-12-18	it's closed	ˈɪtsˈkloʊzd	ɪs kləʊzd	obs+lat-I	1	2;07.23
1969-12-18	dive on the floor	ˈdaɪvˈɑnðəˈflɒɹ	daɪv ɒn ə flɔː	obs+lat-I	1	2;07.23
1970-01-01	they going to dry cleaner	ˈðeɪˈgoʊŋˈtuːˈdɹaɪˈkliːnəɹ	ðeɪ [*] gəʊɪŋ tə dɹaɪ kliːnə	obs+lat-I	1	2;08.07
1970-01-01	catch it with both hands on the floor	ˈkætʃˈɪtˈwɪðˈboʊθˈhændzˈɑnðəˈflɒɹ	kætʃ ɪt wɪð bəʊθ hænz ɒn ə flɔː	obs+lat-I	1	2;08.07
1970-01-01	you're sitting on my dolly's blanket	ˈjuːrˈsɪtɪŋˈɑnˈmaɪˈdɑliːzˈblæŋkət	jɔː sɪtɪŋ ɒn maɪ dɒlɪz blæŋkɪt	obs+lat-I	1	2;08.07
1970-02-12	that's black	ˈðætsˈblæk	ðæts blæk	obs+lat-I	1	2;09.18
1970-02-14	teddy did fall down on the floor	ˈtɛdiːˈdɪdˈfɑlˈdaʊnˈɑnðəˈflɒɹ	tɛdi dɪd fɔ daʊn ɒn ə fɔː [*]	obs+lat-I	3	2;09.20
1970-02-14	you close it	ˈjuːˈkloʊsˈɪt	u kləʊz ɪt	obs+lat-I	1	2;09.20
1970-02-14	have to find another glass one	ˈhævˈtuːˈfaɪndəˈnʌðəɹˈglæsˈwʌn	hæ tʊ faɪnd ənʌðə glɑːs wʌn	obs+lat-I	1	2;09.20
1970-02-14	can my tissue go in please	ˈkænˈmaɪˈtɪsˌjuːˈgoʊənˈpliːz	kæn maɪ tɪʃuː gəʊ ɪn pliːz	obs+lat-I	1	2;09.20
1970-02-14	it can't close now	ˈɪtˈkæntˈkloʊsˈnaʊ	ɪt kɑːn kləʊz naʊ	obs+lat-I	1	2;09.20
1970-02-14	that one's a flat one	ˈðætˈwʌnzəˈflætˈwʌn	ðæt wʌnz ə flæt wʌn	obs+lat-I	1	2;09.20
1970-02-14	go in horse walk in I will close you	ˈgoʊənˈhɒɹsˈwɑkənˈaɹˈwɪlˈkloʊs ˈjuː	gəʊ ɪn hɔːs, wɔːk ɪn aɪ wɪʊ kləʊz uː [*]	obs+lat-I	1	2;09.20
1970-02-14	this one's open that one 's closed	ˈðɪsˈwʌnzˈoʊpənˈðætˈwʌnz ˈkloʊzd	ðɪs wʌnz əʊpən, ðæt wʌnz kləʊzd	obs+lat-I	1	2;09.20
1970-02-14	close it	ˈkloʊsˈɪt	kləʊz ɪt	obs+lat-I	1	2;09.20

1970-02-14	can I open it again please	'kæn'aɪ'oupən'ɪtə'gɛn'pli:z	kæn aɪ əupən ɪt əgɛn pli:z	obs+lat-I	1	2;09.20
1970-02-14	my take a bag up and clothes	'maɪ'teɪkə'bæg'ʌp'ænd'klouðz	<maɪ teɪk> [*] ə bæg ʌp n̩ kləuz	obs+lat-I	1	2;09.20
1970-02-14	open it please	'oupən'ɪt'pli:z	əupən ɪt pli:z	obs+lat-I	1	2;09.20
1970-02-16	Dad might play with my doll	'dæd'maɪt'pleɪ'wɪð'maɪ'dɑl	dæd maɪt pleɪ wɪð maɪ dɒu	obs+lat-I	1	2;09.22
1970-03-15	can I draw please	'kæn'aɪ'dɹɒ'pli:z	kæn aɪ drɔ: pli:z	obs+lat-I	1	2;10.18
1970-03-15	that one's closed	'ðæt'wʌnz'klouzd	ðæt wʌnz kləuzd	obs+lat-I	1	2;10.18
1970-03-23	it's on the floor	'ɪts'ɑnðə'flɒɹ	ɪts ɒn ə flɔ	obs+lat-I	1	2;10.26
1970-03-23	you play Lego please	'ju:'pleɪ'lɛgou'pli:z	ju pleɪ lɛgəu pli:z	obs+lat-I	1	2;10.26
1970-03-23	it's on the floor Jane	'ɪts'ɑnðə'flɒɹ'ʤeɪn	ɪts ɒn ə flɔ ʤeɪn	obs+lat-I	1	2;10.26
1970-03-23	shops is closed on Sunday today	'ʃɑps'ɪz'klouzd'ɑn'sʌn̩deɪtə'deɪ	ʃɒps ɪz [*] kləuzd ɒn sʌndeɪ tədeɪ	obs+lat-I	1	2;10.26
1970-05-08	we had to not play out	'wi:'hæd'tu:'nɑt'pleɪ'aʊt	wi <hæt tə nɒt> [*] pleɪ aʊt	obs+lat-I	1	3;00.13
1970-07-05	he was a fly coming in here	'hi:'wɑzə'flaɪ'kʌmɪŋən'hɪɪ	hi wɒz ə flaɪ kʊmɪŋ ɪn hɪə	obs+lat-I	1	3;02.10
1970-07-05	let me take this down please	'lɛt'mi:'teɪk'ðɪs'daʊn'pli:z	let mi teɪk ðɪs daʊn pli:z	obs+lat-I	1	3;02.10
1970-07-05	there was a fly coming in my forehead	'ðɛɹ'wɑzə'flaɪ'kʌmɪŋən'maɪ 'fɒɹhɛd	ðɛə wɒz ə flaɪ kʌmɪŋ ɪn [*] maɪ fɒrɪd	obs+lat-I	1	3;02.10
1970-07-05	there's a fly just on the curtain	'ðɛɹzə'flaɪ'ʤʌst'ɑnðə'kʌɹtən	ðɛəz ə flaɪ ʤəst ɒn ðə kə:tən	obs+lat-I	1	3;02.10
1970-11-22	please may I have a straw	'pli:z'meɪ'aɪ'hævə'stɹɒ	pli:z meɪ aɪ hæv ə strɔ:	obs+lat-I	1	3;06.28
1968-12-27	chocolate	'ʧɒklət	ʧjək^{h}	obs+lat-M	3	1;08.02
1969-04-10	chocolate biscuit	'ʧɒklət'bɪskət	kɒki bɪskɪt	obs+lat-M	3	1;11.16

1969-04-10	chocolate wipe	'ʧɒklət'waɪp	kɒki [*] waɪp	obs+lat-M	3	1;11.16
1969-04-13	chocolate	'ʧɒklət	kɒki [*]	obs+lat-M	3	1;11.19
1969-04-22	chocolate biscuit	'ʧɒklət'bɪskət	kɒki bɪskɪt	obs+lat-M	3	1;11.28
1969-04-22	Chandley's	'ʧændliːz	tɑːnlɪz [*]	obs+lat-M	2	1;11.28
1969-04-27	cornflakes	'kɒɹn'fleɪks	kɑːnfeɪks [*]	obs+lat-M	3	2;00.02
1969-08-20	like chocolate biscui	'laɪk'ʧɒklət	laɪk kɒki [*] bɪskɪ	obs+lat-M	3	2;03.26
1970-01-01	probably won't	'pɹɑbəbliː'woʊnt	pɒbəbli [*] wənt	obs+lat-M	1	2;08.07
1970-01-01	where's the aeroplane gone	'wɛɹzðə'ɛɹoʊpleɪn'gɒn	wɛəz ə ɛərəpleɪn gɒn	obs+lat-M	1	2;08.07
1968-10-12	brush	'bɹʌʃ	bës	obs+rho-I	3	1;05.17
1968-10-16	pram	præm	pʰæm	obs+rho-I	3	1;05.21
1968-10-19	tree	'tɹiː	tʰiː	obs+rho-I	3	1;05.24
1968-11-18	tree	'tɹiː	t̪əi	obs+rho-I	3	1;06.24
1968-12-10	pram	præm	pʰæmə	obs+rho-I	3	1;07.15
1968-12-10	truck	'tɹʌk	tʰʌkʰ	obs+rho-I	3	1;07.15
1969-01-03	crocodile	'kɹɑkə̩daɪl	kaka	obs+rho-I	3	1;08.09
1969-03-19	broken dolly	'bɹoʊkən'dɑliː	bokʰn [*] dɒli	obs+rho-I	3	1;10.22
1969-04-07	train	'tɹeɪn	t̪e̞ɪn	obs+rho-I	3	1;11.13
1969-04-07	train	'tɹeɪn	teɪn [*]	obs+rho-I	3	1;11.13
1969-04-07	baby's pram	'beɪbiːz'pɹæm	bebɪs pæm [*]	obs+rho-I	3	1;11.13
1969-04-13	more grapes	'mɒɹ'gɹeɪps	mɑ geɪps [*]	obs+rho-I	3	1;11.19
1969-04-13	tricycle dear dear	'tɹɪsɪkəl'dɪɹ'dɪɹ	taɪsɪkl [*] dɪə dɪə	obs+rho-I	3	1;11.19

1969-04-13	like cream	'laɪk'kɹi:m	laɪk ki:m [*]	obs+rho-I	3	1;11.19
1969-04-13	crumbs on the floor	'kɹʌmz'ɑnðə'flɒɹ	kʌmz fɔ	obs+rho-I	3	1;11.19
1969-04-13	more prunes	'mɒɹ'pɹu:nz	mɑ: pu:nz [*]	obs+rho-I	3	1;11.19
1969-04-13	grapes	'gɹeɪps	geɪps [*]	obs+rho-I	3	1;11.19
1969-04-13	prune	'pɹu:n	pu:n [*]	obs+rho-I	3	1;11.19
1969-04-13	Grandpa	'gɹænd,pɑ	gɑgə [*]	obs+rho-I	3	1;11.19
1969-04-13	grape	'gɹeɪp	geɪp [*]	obs+rho-I	3	1;11.19
1969-04-22	crusts to birdies	'kɹʌsts'tu:'bʌɹdi:z	kʌs [*] tə bədɪz	obs+rho-I	3	1;11.28
1969-04-22	drink of milk	'dɹɪŋk'ʌv'mɪlk	dɪnk [*] ə mək	obs+rho-I	3	1;11.28
1969-04-27	ice cream over	'aɪs'kɹi:m'oʊvəɹ	aɪs ki:m [*] əʊvə	obs+rho-I	3	2;00.02
1969-04-27	birdies crust	'bʌɹd'i:z'kɹʌst	bədiz krɪst	obs+rho-I	1	2;00.02
1969-05-03	nose drops	'noʊz'dɹɑps	nəʊ [*] dɒps [*]	obs+rho-I	3	2;00.08
1969-05-04	drink of milk	'dɹɪŋk'ʌv'mɪlk	drɪŋk ə məʊk	obs+rho-I	1	2;00.09
1969-05-26	drink of milk	'dɹɪŋk'ʌv'mɪlk	diɪŋk [*] ə miʊk	obs+rho-I	3	2;01.01
1969-05-26	crusts the birdies	'kɹʌstsðə'bʌɹdi:z	kʌsts [*] ə bə:di:z	obs+rho-I	3	2;01.01
1969-05-26	Lulu bread	'lu:,lu:'bɹɛd	lulu bʊɛd	obs+rho-I	1	2;01.01
1969-05-26	breads	'bɹɛdz	bʊɛdz	obs+rho-I	1	2;01.01
1969-06-01	crusts to the birds	'kɹʌsts'tu:ðə'bʌɹdz	kʌst tə bədiz	obs+rho-I	3	2;01.07
1969-06-16	drink a cup of tea	'dɹɪŋkə'kʌp'ʌv'ti:	dɪŋk [*] ə kʌp ə tɪi	obs+rho-I	3	2;01.22
1969-06-16	dropped it again	'dɹɑpt'ɪtə'gɛn	dɒpt ɪt əgeɪn	obs+rho-I	3	2;01.22
1969-08-07	there's a tractor	'ðɛɹzə'tɹæktəɹ	dɛəz ə tæktə [*]	obs+rho-I	3	2;03.13

1969-08-20	there's Daddy's briefcase	ˈðɛɪzˈdædiːzˈbɪiːfˌkeɪs	dɛəz dædɪz biːfkeɪs [*]	obs+rho-I	3	2;03.26
1969-08-20	an ice cream man	ˈænˈaɪsˈkɪiːmˈmæn	ən aɪs kriːm mæn	obs+rho-I	1	2;03.26
1969-08-20	mine's a throwing down	ˈmaɪnzəˈθɪoʊɪŋˈdaʊn	maɪnz ə sɪlɪ bɪlɪ frəʊɪŋ [*] daʊn	obs+rho-I	1	2;03.26
1969-08-20	bye bye ice cream man	ˈbaɪˈbaɪˈaɪsˈkɪiːmˈmæn	baɪ baɪ aɪs kriːm mæn	obs+rho-I	1	2;03.26
1969-08-30	like to go on the train	ˈlaɪkˈtuːˈgoʊˈɑnðəˈtɪeɪm	laɪk ə gəʊ ɒn ə treɪn	obs+rho-I	1	2;04.05
1969-10-07	me like a drink of water	ˈmiːˈlaɪkəˈdɹɪŋkˈʌvˈwɒtəɹ	mə [*] laɪk ə drɪŋk ə wɔtə	obs+rho-I	1	2;05.12
1969-10-10	me like through there	ˈmiːˈlaɪkˈθɹuːˈðɛɹ	mɑ [*] laɪk ə gəʊ fruː [*] ðɛə	obs+rho-I	1	2;05.15
1969-10-10	me like that Grandpa	ˈmiːˈlaɪkˈðætˈgɹændˌpɑ	mɑ [*] laɪk ðæt grɑmpɑ	obs+rho-I	1	2;05.15
1969-10-10	those are crabs	ˈðoʊzˈɑɹˈkɹæbz	ðəʊz ə bræbz [*]	obs+rho-I	1	2;05.15
1969-10-10	feed the grass to bunny rabbits too	ˈfiːdðəˈgɹæsˈtuːˈbʌniːˈɹæˌbɪtsˈtuː	fiːd ə grɑːs tʊ bʌni ræbɪts tu	obs+rho-I	1	2;05.15
1969-10-10	that's a crab	ˈðætsəˈkɹæb	ðæs [*] ə kræb	obs+rho-I	1	2;05.15
1969-10-10	those are breads	ˈðoʊzˈɑɹˈbɹɛdz	dəʊz [*] ə brɛdz	obs+rho-I	1	2;05.15
1969-10-17	press that for mine	ˈpɹɛsˈðætˈfɒɹˈmaɪn	prɛs ðæt fɔ maɪn [*]	obs+rho-I	1	2;05.22
1969-10-17	like to get a pram	ˈlaɪkˈtuːˈgɛtəˈpræm	laɪk ə gɪt ə præm	obs+rho-I	1	2;05.22
1969-11-02	not too bright to Daddy	ˈnɑtˈtuːˈbɹaɪtˈtuːˈdædiː	nɒt tu braɪt tə [*] dædi	obs+rho-I	1	2;06.08
1969-11-08	Mummy's getting dressed	ˈmʌmiːzˈgɛtɪŋˈdɹɛst	mʌmɪz gɛtɪn drɛst	obs+rho-I	1	2;06.14
1969-11-19	shall we cut the fringe	ˈʃælˈwiːˈkʌtðəˈfɹɪnʤ	sæ [*] wi kʌt ə fɪnʒ [*]	obs+rho-I	3	2;06.25
1969-11-19	do Lucky's fringe in a minute	ˈduːˈlʌkiːzˈfɹɪnʤənəˈmɪnət	du lʌkɪz fɪnʒ [*] ɪn ə mɪnɪt	obs+rho-I	3	2;06.25

1969-11-19	to do it back to front	ˈtuːˈduːˈɪtˈbækˈtuːˈfɪʌnt	ðæt kɑːnt raɪt tə duː ɪt bæk tə frʌnt	obs+rho-I	1	2;06.25
1969-11-19	dolly's back to front	ˈdɑliːzˈbækˈtuːˈfɪʌnt	dɒliz bæk tə frʌnt	obs+rho-I	1	2;06.25
1969-11-19	dolly is back to front	ˈdɑliːˈɪzˈbækˈtuːˈfɪʌnt	dɒli ɪz bæk tə frʌnt	obs+rho-I	1	2;06.25
1969-11-19	bring a potty for dolly	ˈbɹɪŋəˈpɑtiːˈfɒɹˈdɑliː	bɪŋ [*] ə pɒti fɔ dɒli	obs+rho-I	3	2;06.25
1969-11-19	my haven't got fried egg	ˈmaɪˈhævntˈgɑtˈfɪaɪdˈɛg	maɪ [*] hævənt gɒt fraɪd ɛg	obs+rho-I	1	2;06.25
1969-11-19	push dolly back to front again	ˈpʊʃˈdɑliːˈbækˈtuːˈfɪʌntəˈgɛn	pʊʃ dɒli bæk tu frʌnt əgeɪn	obs+rho-I	1	2;06.25
1969-11-25	Jenny did broken it	ˈʤɛniːˈdɪdˈbɹoʊkənˈɪt	ʤɛni <dɪd brəʊkən> [*] ɪt	obs+rho-I	1	2;07.00
1969-12-06	Lulu want to draw	ˈluːˌluːˈwɑntˈtuːˈdɹɒ	lulu wɒnt tə dɔ [*]	obs+rho-I	3	2;07.11
1969-12-06	can I draw	ˈkænˈaɪˈdɹɒ	kæn aɪ dɔ [*]	obs+rho-I	3	2;07.11
1969-12-06	my like to draw	ˈmaɪˈlaɪkˈtuːˈdɹɒ	mɑ [*] laɪk tə dɔ [*]	obs+rho-I	3	2;07.11
1969-12-06	let my pram go up there	ˈlɛtˈmaɪˈpɹæmgoʊˈʌpˈðɛɹ	let maɪ præm gəʊ ʌp dɛə	obs+rho-I	1	2;07.11
1969-12-06	not on my bread	ˈnɑtˈɑnˈmaɪˈbɹɛd	nɒt ɒn maɪ brɛd	obs+rho-I	1	2;07.11
1969-12-18	make a bridge	ˈmeɪkəˈbɹɪʤ	meɪk ə brɪdʒ	obs+rho-I	1	2;07.23
1969-12-18	we're going crossing the road	ˈwiːɹˈgoʊɪŋˈkɹɒsɪŋðəˈɹoʊd	wɪə gəʊɪn krɒsɪn ə rəʊd	obs+rho-I	1	2;07.23
1969-12-18	hello ice cream	həˈloʊˈaɪsˈkɹiːm	hɛləʊ aɪs kriːm [*]	obs+rho-I	1	2;07.23
1969-12-31	my had a drink of water upstairs	ˈmaɪˈhædəˈdɹɪŋkˈʌvˈwɒtəɹəpˈsteɪz	maɪ [*] hæd ə drɪŋk ə wɔtə ʌpsteəz	obs+rho-I	1	2;08.06
1970-01-01	probably won't	ˈpɹɑbəbliːˈwoʊnt	pɒbəbli [*] wənt	obs+rho-I	3	2;08.07
1970-01-01	very precious	ˈvɛɹiːˈpɹɛʃəs	vɛrɪ prɛʃəs	obs+rho-I	1	2;08.07
1970-01-01	they going to dry cleaner	ˈðeɪˈgoʊɪŋˈtuːˈdɹaɪˈkliːnəɹ	ðeɪ [*] gəʊɪŋ tə draɪ kliːnə	obs+rho-I	1	2;08.07

1970-01-02	that one can't be dry to long time	'ðæt'wʌn'kænt'bi:'dɹaɪ'tu:'lɒŋ 'taɪm	ðæt wʌn kɑ:nt bi: dɹaɪ tə lɒŋ taɪm	obs+rho-I	1	2;08.08
1970-01-02	she'll draw on that boardie	'ʃi:l'dɹɒ'ɑn'ðæt	ʃl drɔ: ɒn ðæt bɔ:di	obs+rho-I	1	2;08.08
1970-01-02	can I have another drink	'kæn'aɪ'hævə'nʌðəɹ'dɹɪŋk	kæn aɪ hæv ənʌðə drɪŋk	obs+rho-I	1	2;08.08
1970-01-11	beat his bottom if he cries	'bi:t'hɪz'bɑtəm'ɪf'hi:'kɹaɪz	bi:t ɪz bɒtm̩ ɪf i kaɪz [*]	obs+rho-I	3	2;08.17
1970-01-11	it's my crayon	'ɪts'maɪ'kɹeɪˌɑn	ɪts maɪ kreɪən	obs+rho-I	1	2;08.17
1970-02-01	you got a pretty hair	'ju:'gɑtə'pɹɪti:'hɛɹ	u gɒt ə pɹɪti hɛə	obs+rho-I	1	2;09.07
1970-02-01	cause it's very precious for mine	'kɑz'ɪts'vɛɹi:'pɹɛʃəs'fɒɹ'maɪn	kɒs ɪts vɛri pɹɛʃəs fə [*] maɪn [*]	obs+rho-I	1	2;09.07
1970-02-14	my will drink all my milk	'maɪ'wɪl'dɹɪŋk'ɒl'maɪ'mɪlk	ma [*] wɪl dɹɪŋk ɔʊ maɪ mɪʊk	obs+rho-I	1	2;09.18
1970-02-12	my can draw it	'maɪ'kæn'dɹɒ'ɪt	maɪ [*] kæn drɔr ɪt	obs+rho-I	1	2;09.18
1970-02-12	draw small one	'dɹɒ'smɒl'wʌn	drɔ smɔ:l wʌn	obs+rho-I	1	2;09.18
1970-02-14	I haven't got one and two and three	'aɪ'hævnt'gɑt'wʌn'ænd'tu:'ænd 'θɹi:	aɪ hævn̩ gɒt wʌn æn tu: æn ɵri:	obs+rho-I	1	2;09.20
1970-02-14	and it breaked	'ænd'ɪt'bɹeɪkt	n: ɪt breɪkt [*]	obs+rho-I	1	2;09.20
1970-02-14	my did cry to teddy bear	'maɪ'dɪd'kɹaɪ'tu:'tɛdi:'bɛɹ	maɪ [*] dɪd kraɪ tə [*] tɛdi bɛə	obs+rho-I	1	2;09.20
1970-02-14	this is Grandpa's	'ðɪs'ɪz'gɹænd͡ˌpɑz	ðɪs ɪz græmpɑ:z	obs+rho-I	1	2;09.20
1970-02-14	you will press my bag	'ju:'wɪl'pɹɛs'maɪ'bæg	ju wɪl prɛs maɪ bæg	obs+rho-I	1	2;09.20
1970-02-14	Jenny's crayon	'ʤɛni:z'kɹeɪˌɑn	ʤɛnɪz kreɪən	obs+rho-I	1	2;09.20
1970-02-14	it's too many things to drop	'ɪts'tu:'mɛni:'θɪŋz'tu:'dɹɑp	ɪts tu: mɛni ɵɪŋz tə drɒp	obs+rho-I	1	2;09.20
1970-02-14	can I have one and two and three and four	'kæn'aɪ'hæv'wʌn'ænd'tu:'ænd'θɹi: 'ænd'fɒɹ	kæn aɪ hæv wʌn æn tu: æn ɵri: æn fɔ:	obs+rho-I	1	2;09.20

1970-02-14	look after these crayons	ˈlʊkˈæftəɹˈðiːzˈkɹeɪˌɑnz	lʊk ɑːftə ðiːz kreɪn̩z [*]	obs+rho-I	1	2;09.20
1970-02-16	there's one broken wheel	ˈðɛɹzˈwʌnˈbɹoʊkənˈwiːl	ðɛəz wʌn brəʊkən wiːl	obs+rho-I	1	2;09.22
1970-03-07	it's not drawed	ˈnɑtˈdɹɒd	ɪts nɒt drɔwəd [*]	obs+rho-I	1	2;10.10
1970-03-07	that one's from Daddy	ˈðætˈwʌnzˈfɪʌmˈdædiː	ðæt wʌnz frɒm dædi	obs+rho-I	1	2;10.10
1970-03-07	can I draw	ˈkænˈaɪˈdɹɒ	kæn aɪ drɔ	obs+rho-I	1	2;10.10
1970-03-07	under the bridge	ˈʌndəɹðəˈbɹɪʤ	ʌndə ðə brɪdʒ	obs+rho-I	1	2;10.10
1970-03-07	draw on this page	ˈdɹɒˈɑnˈðɪsˈpeɪʤ	drɔ.r ɒn ðɪs peɪdʒ	obs+rho-I	1	2;10.10
1970-03-15	draw Phil again	ˈdɹɒˈfɪləˈgɛn	dɔ [*] fʊl [*] əgen	obs+rho-I	3	2;10.18
1970-03-15	can I draw please	ˈkænˈaɪˈdɹɒˈpliːz	kæn aɪ drɔː pliːz	obs+rho-I	1	2;10.18
1970-03-23	I say scream	ˈaɪˈseɪˈskɹiːm	aɪ seɪ skiːm [*]	obs+rho-I	-	2;10.26
1970-03-23	with this try it	ˈwɪðˈðɪsˈtɹaɪˈɪt	wɪð ðɪs traɪ ɪt	obs+rho-I	1	2;10.26
1970-03-23	you're not cross with me	ˈjuːɹˈnɑtˈkɹɒsˈwɪðˈmiː	jɔ nɒt krɒs wɪð mi	obs+rho-I	1	2;10.26
1970-03-23	I didn't draw Jenny	ˈaɪˈdɪdntˈdɹɒˈʤɛniː	aɪ dɪdn̩ drɔ dʒɛni	obs+rho-I	1	2;10.26
1970-03-23	I want to draw Jenny	ˈaɪˈwɑntˈtuːˈdɹɒˈʤɛniː	aɪ wɒnt tə drɔ dʒɛni	obs+rho-I	1	2;10.26
1970-07-05	I drinked it very carefully	ˈaɪˈdɹɪŋktˈɪtˈvɛɹiːˈkɛɹfəliː	aɪ dɪŋkt [*] ɪt veri kɛəfʊli	obs+rho-I	3	3;02.10
1970-07-05	Grandad give me this	ˈgɹænˌdædˈgɪvˈmiːˈðɪs	grændæ gɪ [*] mi ðɪs	obs+rho-I	1	3;02.10
1970-09-24	don't throw it down	ˈdɑntˈθɹoʊˈɪtˈdaʊn	dəʊn ərəʊ ɪt daʊn	obs+rho-I	1	3;04.30
1970-11-22	please may I have a straw	ˈpliːzˈmeɪˈaɪˈhævəˈstɹɒ	pliːz meɪ aɪ hæv ə strɔː	obs+rho-I	-	3;06.28
1969-04-13	umbrella	əmˈbɹɛlə	ʌmbɛlə [*]	obs+rho-M	3	1;11.19
1969-04-13	umbrella	əmˈbɹɛlə	ʌmbrɛlə	obs+rho-M	1	1;11.19
1969-08-20	Andrew's a big boy	ˈændɹuːzəˈbɪgˈbɔɪ	ændruːz ə bɪg bɔɪ	obs+rho-M	1	2;03.26

1969-10-10	John's getting a toothbrush out	ˈʤɑnzˈgɛtɪŋəˈtuːθˌbɹʌʃˈaʊt	ʤɔnz gɪtɪŋ ə tuːəbrʌʃ aʊt	obs+rho-M	1	2;05.15
1969-10-10	toothbrush	ˈtuːθˌbɹʌʃ	tuːsbrʌʃ [*]	obs+rho-M	1	2;05.15
1969-10-17	mine's going to Cambridge	ˈmaɪnzˈgoʊɪŋˈtuːˈkɛɪmbɹɪʤ	maɪnz [*] gəʊɪn tə kɛɪmbrɪdʒ	obs+rho-M	1	2;05.22
1969-11-05	my go to Africa to long time	ˈmaɪˈgoʊˈtuːˈæfɪkəˈtuːˈlɒŋˈtaɪm	maɪ [*] gəu tu æfrɪkə tə [*] lɒŋ taɪm	obs+rho-M	1	2;06.11
1969-11-19	that's a big library book	ˈðætsəˈbɪgˈlaɪbˌɹɛɹiːˈbʊk	ðæts ə bɪg laɪbi [*] bʊk	obs+rho-M	3	2;06.25
1969-11-19	mine is hungry today	ˈmaɪnˈɪzˈhʌŋgɹiːtəˈdeɪ	<maɪn ɪz> hʌŋgri tədeɪ	obs+rho-M	1	2;06.25
1969-12-18	those are my library books	ˈðoʊzˈɑɹˈmaɪˈlaɪbˌɹɛɹiːˈbʊks	ðəʊz ə maɪ laɪbri bʊks	obs+rho-M	1	2;07.23
1970-02-01	lunch time everybody	ˈlʌnʧˈtaɪmˈɛvɹiːˌbɑdiː	lʌntʃ taɪm ɛvribɒdi	obs+rho-M	1	2;09.07
1970-02-16	I can see everybody here	ˈaɪˈkænˈsiːˈɛvɹiːˌbɑdiːˈhɪɹ	aɪ kæn siː ɛvribɒdi hɪə	obs+rho-M	1	2;09.22
1968-10-24	sweetie	ˈwiːtiː	tɪsi	s+gli-I	5	1;05.29
1968-11-18	sweetie	ˈwiːtiː	ʂiʈi	s+gli-I	3	1;06.24
1968-12-27	sweetie	ˈwiːtiː	ʈipi	s+gli-I	5	1;08.02
1968-12-27	sweetie	ˈwiːtiː	ʂipi	s+gli-I	3	1;08.02
1968-12-27	sweetie	ˈwiːtiː	ʂipi	s+gli-I	3	1;08.02
1969-03-28	swimming	ˈswɪmɪŋ	fimɪŋ [*]	s+gli-I	5	1;11.03
1969-04-13	swimming	ˈswɪmɪŋ	ʂɪmɪn [*]	s+gli-I	3	1;11.19
1969-05-13	swimming	ˈswɪmɪŋ	fimɪn [*]	s+gli-I	5	2;00.18
1969-06-05	swimming	ˈswɪmɪŋ	pɪmɪn [*]	s+gli-I	5	2;01.11
1969-06-05	swimming	ˈswɪmɪŋ	fimɪn	s+gli-I	5	2;01.11
1969-09-13	there's the swimming	ˈðɛɹzðəˈswɪmɪŋ	ðɛəz ə swɪmɪn	s+gli-I	1	2;04.19

1969-10-10	my did feed swans	'maɪ'dɪd'fi:d'swɑnz	maɪ [*] dɪd fi:d swɒnz	s+gli-I	1	2;05.15
1970-01-01	sweet talk to dolly	'swi:t'tɒk'tu:'dɑli:	swi tɒk tə dɒli	s+gli-I	1	2;08.07
1970-02-01	my got my sweetie to put in	'maɪ'gɑt'maɪ'swi:ti:'tu:'pʊtən	mɑ [*] gɒt maɪ swi:ti tə pʊt ɪn	s+gli-I	1	2;09.07
1969-12-18	getting a tissue out	'gɛtɪŋə'tɪsˌju:'aʊt	gɛtɪn ə tɪʃu aʊt	s+gli-M	3	2;07.23
1970-02-14	can my tissue go in please	'kæn'maɪ'tɪsˌju:'goʊən'pli:z	kæn maɪ tɪʃu: gəʊ ɪn pli:z	s+gli-M	3	2;09.20
1970-02-14	she hasn't got one tissue	'ʃi:'hæznt'gɑt'wʌn'tɪsˌju:	ʃi: hæzn gɒt wʌn tɪʃu:	s+gli-M	3	2;09.20
1970-02-14	Jenny's tissues	'ʤɛni:z'tɪsˌju:z	ʤɛnɪz tɪʃu:z	s+gli-M	3	2;09.20
1969-03-28	sleep	'sli:p	ʂi:p	s+lat-I	3	1;11.03
1969-04-13	Teddy go to sleep	'tɛdi:'goʊ'tu:'sli:p	tɛdi ʂi:p [*]	s+lat-I	3	1;11.19
1969-04-22	slip off	'slɪp'ɒf	sɪp [*] ɒf	s+lat-I	3	1;11.28
1969-04-22	sleep on Daddy no	'sli:p'ɑn'dædi:'noʊ	ʂi:p [*] ɒn dædi nöʊ	s+lat-I	3	1;11.28
1969-04-22	slippers	'slɪpəɹz	ʂɪpəz [*]	s+lat-I	3	1;11.28
1969-04-22	slide	'slaɪd	saɪd [*]	s+lat-I	3	1;11.28
1969-06-01	sleeping Daddy	'sli:pɪŋ'dædi:	fi:fɪŋ [*] dædi	s+lat-I	5	2;01.07
1969-06-16	good night go to sleep	'gʊd'naɪt'goʊ'tu:'sli:p	gʊd naɪt gəʊ tə si:p [*]	s+lat-I	3	2;01.22
1969-08-20	go to sleep	'goʊ'tu:'sli:p	gu: [*] tə sli:p	s+lat-I	1	2;03.26
1969-08-20	two dollies sleeping now	'tu:'dɑli:z'sli:pɪŋ'naʊ	tu dɒlɪz sli:pɪŋ naʊ	s+lat-I	1	2;03.26
1969-08-20	two little dollies sleeping here	'tu:'lɪtəl'dɑli:z'sli:pɪŋ'hɪɹ	tu lɪtʊ dɒlɪz sli:pɪŋ hɪə	s+lat-I	1	2;03.26
1969-10-17	Lucky's going to sleep	'lʌki:z'goʊɪŋ'tu:'sli:p	lʌkɪz gəʊɪn tə sli:p	s+lat-I	1	2;05.22
1969-11-13	Lucky's going to sleep on his pillow	'lʌki:z'goʊɪŋ'tu:'sli:p'ɑn'hɪz'pɪloʊ	lʌkɪz gəʊɪn tə sli:p ɒn ɪz pɪləʊ	s+lat-I	1	2;06.19

1969-11-13	Lucky's going to sleepy	ˈlʌkiːzˈgoʊɪŋˈtuːˈsliːpiː	lʌkɪz gəʊɪn tə sliːpi	s+lat-I	1	2;06.19
1969-11-13	Lucky's going to sleep	ˈlʌkiːzˈgoʊɪŋˈtuːˈsliːp	lʌkiz gəʊɪn tə sliːp	s+lat-I	1	2;06.19
1969-11-13	Lucky like to go to sleep with a pillow	ˈlʌkiːˈlaɪkˈtuːˈgoʊˈtuːˈsliːpˈwɪðə ˈpɪloʊ	lʌki laɪk tə gəʊ tə sliːp wɪð ə pɪləʊ	s+lat-I	1	2;06.19
1969-11-19	my dolly's sitting go to sleep	ˈmaɪˈdɑliːzˈsɪtɪŋˈgoʊˈtuːˈsliːp	mɑ dɒlɪz sɪtɪŋ gəʊ tə sliːp	s+lat-I	1	2;06.25
1969-11-19	like to go to sleep quick	ˈlaɪkˈtuːˈgoʊˈtuːˈsliːpˈkwɪk	laɪk tə gəʊ tə sliːp kwɪk	s+lat-I	1	2;06.25
1969-12-18	Jenny's a little baby to go to sleep	ˈʤɛniːzəˈlɪtəlˈbeɪbiːˈtuːˈgoʊˈtuː ˈsliːp	dɛniz [*] ə lɪtʊ beɪbi tə gəʊ tə sliːp	s+lat-I	1	2;07.23
1969-02-01	my will be lost if I go to sleep	ˈmaɪˈwɪlˈbiːˈlɒstˈɪfˈaɪˈgoʊˈtuːˈsliːp	maɪ [*] wɪl bi lɒst ɪf aɪ gəʊ tə sliːp	s+lat-I	1	2;09.07
1969-02-14	Lucky's having a little sleep	ˈlʌkiːzˈhævɪŋəˈlɪtəlˈsliːp	lʌkiz ævɪn ə lɪtʊ sliːp	s+lat-I	1	2;09.20
1969-02-14	she had a little sleep Jenny did	ˈʃiːˈhædəˈlɪtəlˈsliːpˈʤeniːˈdɪd	ʃi hæd ə lɪtʊ slip ʤɜeni dɪd	s+lat-I	1	2;09.20
1969-08-07	Teddy's fast asleep again	ˈtɛdiːzˈfæstəˈsliːpəˈgɛn	tɛdɪz fɑːst əsliːps əgɛn	s+lat-M	1	2;03.13
1969-08-07	Teddy's fast asleep again	ˈtɛdiːzˈfæstəˈsliːpəˈgɛn	tɛdɪz fɑːst əsliːps əgɛn	s+lat-M	1	2;03.13
1969-08-07	Lucky fast asleep in a minute	ˈlʌkiːˈfæstəˈsliːpənəˈmɪnət	lʌki fɑːst əsliːp ɪn ə mɪnɪt	s+lat-M	1	2;03.13
1969-08-07	Lucky's fast asleep in a bed	ˈlʌkiːzˈfæstəˈsliːpənəˈbɛd	ləkɪz fɑst əsliːp ɪn ə bed	s+lat-M	1	2;03.13
1969-08-07	Lucky's fast asleep in a bed	ˈlʌkiːzˈfæstəˈsliːpənəˈbɛd	ləkɪz fɑst əsliːp ɪn ə bed	s+lat-M	1	2;03.13
1969-08-20	Lucky's asleep	ˈlʌkiːzəˈsliːp	lʌkiz əsliːp	s+lat-M	1	2;03.26
1969-09-21	Jenny's asleep	ˈʤeniːzəˈsliːp	ʤɜeniz əsliːp	s+lat-M	1	2;04.27
1969-12-31	dolly's fast asleep	ˈdɑliːzˈfæstəˈsliːp	dɒlɪz fɑst əsliːp	s+lat-M	1	2;08.06
1969-07-02	a snake	əˈsneɪk	ə sneɪk	s+nas-I	1	2;02.07

1969-08-07	those are snakes Daddy	ˈðoʊzˈɑɪˈsneɪksˈdædiː	dəʊz ə sneɪks dædi	s+nas-I	1	2;03.13
1969-08-07	Mummy's sneezing	ˈmʌmiːzˈsniːzɪŋ	mʌmɪz sniːzɪŋ	s+nas-I	1	2;03.13
1970-02-12	draw small one	ˈdɹɒˈsmɒlˈwʌn	drɔ smɔːl wʌn	s+nas-I	1	2;09.18
1970-02-14	make a big smaller one	ˈmeɪkəˈbɪgˈsmɒləɹˈwʌn	meɪk ə bɪg smɔːlə wʌn	s+nas-I	1	2;09.20
1970-02-14	a long big smaller one	əˈlɒŋˈbɪgˈsmɒləɹˈwʌn	ə lɒŋ bɪg smɔːlə wʌn	s+nas-I	1	2;09.20
1970-03-15	it's smaller	ˈɪtsˈsmɒləɹ	ɪts smɔːlə	s+nas-I	1	2;10.18
1970-10-24	the smoke 's coming out isn't it	ðəˈsmoʊksˈkʌmɪŋˈaʊtˈɪznt'ɪt	ðə smǝʊks kʌmɪŋ ɑʊt ɪznt ɪt	s+nas-I	1	3;05.29
1969-04-10	more toast	ˈmɒɹˈtoʊst	mɑː təʊst	s+obs-F	1	1;11.16
1969-04-10	toast	ˈtoʊst	tɒst	s+obs-F	1	1;11.16
1969-04-10	toast another	ˈtoʊstəˈnʌðəɹ	təʊst lɛləʊ	s+obs-F	1	1;11.16
1969-04-22	crusts to birdies	ˈkɹʌstsˈtuːˈbʌɹdiːz	kʌs [*] tə bədɪz	s+obs-F	3	1;11.28
1969-04-22	all gone pen last time	ˈɒlˈgɒnˈpenˈlæstˈtaɪm	ɔ gɒn pɪn lɑs taɪm	s+obs-F	3	1;11.28
1969-04-27	Jenny toast	ˈʤeniːˈtoʊst	ʤɛni [*] təʊ	s+obs-F	4	2;00.02
1969-04-27	toast	ˈtoʊst	təʊst	s+obs-F	1	2;00.02
1969-04-27	toast back	ˈtoʊstˈbæk	təʊst bæk	s+obs-F	1	2;00.02
1969-04-27	birdies crust	ˈbʌɹdˈiːzˈkɹʌst	bədiz krɪst	s+obs-F	1	2;00.02
1969-05-03	Lucy's first now	ˈluːsiːzˈɛsˈfʌɹstˈnaʊ	luluz fəst nɑʊ	s+obs-F	1	2;00.08
1969-05-04	more toast	ˈmɒɹˈtoʊst	mɔː təʊtəʊ	s+obs-F	2	2;00.09
1969-05-24	more toast	ˈmɒɹˈtoʊst	mɔ təʊ təʊ	s+obs-F	4	2;00.29
1969-05-24	piece of toast	ˈpiːsˈʌvˈtoʊst	piːs ə təʊst	s+obs-F	1	2;00.29

1969-05-26	more toast	ˈmɒɹˈtoʊst	mɑ: təʊtəʊz	s+obs-F	4	2;01.01
1969-05-26	crusts the birdies	ˈkɹʌstsðəˈbʌɹdiːz	kʌsts [*] ə bəːdiːz	s+obs-F	1	2;01.01
1969-06-01	nest	ˈnɛst	nəst	s+obs-F	1	2;01.07
1969-06-01	crusts to the birds	ˈkɹʌstsˈtuːðəˈbʌɹdz	kʌst tə bədiz	s+obs-F	1	2;01.07
1969-07-02	Lulu has marmalade on her toast	ˈluːˌluːˈhæzˈmɑɹməˌleɪdˈɑnhəɹ ˈtoʊst	lulu mɑmleɪd ɒn ə təʊtəʊ	s+obs-F	4	2;02.07
1969-08-07	Lucky fast asleep in a minute	ˈlʌkiːˈfæstəˈsliːpənəˈmɪnət	lʌki fɑːst əsliːp ɪn ə mɪnɪt	s+obs-F	1	2;03.13
1969-08-07	Teddy's fast asleep again	ˈtɛdiːzˈfæstəˈsliːpəˈgɛn	tɛdɪz fɑːst əsliːps əgɛn	s+obs-F	1	2;03.13
1969-08-07	Lucky's fast asleep in a bed	ˈlʌkiːzˈfæstəˈsliːpənəˈbɛd	ləkɪz fɑst əsliːp ɪn ə bed	s+obs-F	1	2;03.13
1969-08-20	just those	ˈʤʌstˈðoʊz	dəs [*] dəʊz	s+obs-F	3	2;03.26
1969-08-20	it's not past eight o'clock	ˈɪtsˈnɑtˈpæstˈeɪtˈoʊˈklɑk	ɪts nɒt plɑːst [*] eɪt əklɒk	s+obs-F	1	2;03.26
1969-10-07	toast is not burning	ˈtoʊstˈɪzˈnɑtˈbʌɹnɪŋ	təʊs ɪz nɒt bəːnɪŋ	s+obs-F	3	2;05.12
1969-10-10	like to get some toast for Daddy	ˈlaɪkˈtuːˈgɛtˈsʌmˈtoʊstˈfɒɹˈdædiː	laɪk ə gɪt sʌm təʊs fɔ dædi	s+obs-F	3	2;05.15
1969-10-10	Daddy's got a piece of toast	ˈdædiːzˈgɑtəˈpiːsˈʌvˈtoʊst	dædɪz gɒt ə piːs ə təʊst	s+obs-F	1	2;05.15
1969-10-23	like a piece of toast	ˈlaɪkəˈpiːsˈʌvˈtoʊst	laɪk ə piːs ə təʊst	s+obs-F	1	2;05.28
1969-11-08	I had a bug to last night	ˈaɪˈhædəˈbʌgˈtuːˈlæstˈnaɪt	aɪ hæd ə bʌg tə lɑːs naɪt	s+obs-F	3	2;06.14
1969-11-08	put that story book away first	ˈpʊtˈðætˈstɒɹiːˈbʊkəwˈweɪˈfʌɹst	pʊt dæt [*] stɔri bʊk əweɪ fəst	s+obs-F	1	2;06.14
1969-11-19	dolly must have a	ˈdɑliːˈmʌstˈhævə	dɒli mʌs hæv ə wiwi	s+obs-F	3	2;06.25
1969-11-19	can I have buttered toast Mum	ˈkænˈaɪˈhævˈbʌtəɹdˈtoʊstˈmʌm	kæn aɪ hæv bʌtəd təʊs mʌm	s+obs-F	3	2;06.25
1969-11-19	can I have some buttered toast	ˈkænˈaɪˈhævˈsʌmˈbʌtəɹdˈtoʊst	kæn aɪ hæv sʌm bʌtəd təʊsti	s+obs-F	1	2;06.25

1969-11-19	don't take my vest off	ˈdɑntˈteɪkˈmaɪˈvɛstˈɒf	dəʊn teɪk maɪ vɛst ɒf	s+obs-F	1	2;06.25
1969-12-06	Mummy's got waste paper more	ˈmʌmiːzˈgɑtˈweɪstˈpeɪpəɹˈmɒɹ	mʌmɪz gɒt weɪs peɪpə mɔ	s+obs-F	3	2;07.11
1969-12-06	my lost it	ˈmaɪˈlɒstˈɪt	maɪ [*] lɒst ɪt	s+obs-F	1	2;07.11
1970-01-02	mine did one fast	ˈmaɪnˈdɪdˈwʌnˈfæst	maɪn [*] dɪd wʌn fɑst	s+obs-F	1	2;08.08
1970-02-01	my will be lost if I go to sleep	ˈmaɪˈwɪlˈbiːˈlɒstˈɪfˈaɪˈgoʊˈtuːˈsliːp	maɪ [*] wɪl bi lɒst ɪf aɪ gəʊ tə sliːp	s+obs-F	1	2;09.07
1970-07-05	I just losted it under the chair	ˈaɪˈʤʌstˈɪtˈʌndəɹðəˈʧɛɹ	aɪ ʤəst lɒstɪd [*] ɪt ʌndə ðə ʧɛə	s+obs-F	1	3;02.10
1970-07-05	there's a fly just on the curtain	ˈðɛɹzəˈflaɪˈʤʌstˈɑnðəˈkʌɹtən	ðɛəz ə flaɪ ʤəst ɒn ðə kəːtən	s+obs-F	1	3;02.10
1970-09-24	I just goed home	ˈaɪˈʤʌstˈgoʊəd'hoʊm	aɪ ʤəst gəʊd [*] həʊm	s+obs-F	1	3;04.30
1968-10-16	stairs	ˈsteɹz	dɛə	s+obs-I	2	1;05.21
1968-10-23	spoon	ˈspuːn	bəʊm	s+obs-I	2	1;05.28
1968-10-31	spoon	ˈspuːn	bʊːn	s+obs-I	2	1;06.06
1968-11-07	scarf	ˈskɑɹf	gɑː	s+obs-I	2	1;06.13
1969-04-07	spoons	ˈspuːnz	puːnts	s+obs-I	2	1;11.13
1969-04-13	starlings	ˈstɑɹlɪŋz	tɑːlɪŋks [*]	s+obs-I	2	1;11.19
1969-05-04	starlings	ˈstɑɹlɪŋz	taːlɪŋs [*]	s+obs-I	2	2;00.09
1969-05-04	combing stop now	ˈkoʊmɪŋˈstɑpˈnaʊ	kəʊmɪn stɒp naʊ	s+obs-I	1	2;00.09
1969-05-26	another starling	əˈnʌðəɹˈstɑɹˈlɪŋ	lɛləʊ tɑːlɪn [*]	s+obs-I	2	2;01.01
1969-05-26	look starling	ˈlʊkˈstɑɹlɪŋ	lʌk tɑlɪn [*]	s+obs-I	2	2;01.01

1969-06-01	skin on it	ˈskɪnˈɑnˈɪt	kɪn [*] ɒn it	s+obs-I	2	2;01.07
1969-08-20	got sticky hand	ˈgɑtˈstɪkiːˈhænd	gɒt stɪkɪ hænd	s+obs-I	1	2;03.26
1969-08-20	those going to Stockport	ˈðoʊzˈgoʊɪŋˈtuːˈstɑkˈpɒɹt	ðəʊz gəʊɪn tə stɒkpɔːt	s+obs-I	1	2;03.26
1969-08-20	spilled a little bit here	ˈspɪldəˈlɪtəlˈbɪtˈhɪɹ	spiʊt ə lɪtʊ bɪt hɪə	s+obs-I	1	2;03.26
1969-08-20	that's going to Stockport	ˈðætsˈgoʊɪŋˈtuːstɒkpɔːt	dæs gəʊɪn tə stɒkpɔːt	s+obs-I	1	2;03.26
1969-10-10	there's a spade	ˈðɛɹzəˈspeɪd	ðɛəz ə speɪd	s+obs-I	1	2;05.15
1969-11-08	put that story book away first	ˈpʊtˈðætˈstɒɹiːˈbʊkəwˈweɪˈfʌɪst	pʊt dæt [*] stɔri bʊk əweɪ fəst	s+obs-I	1	2;06.14
1969-11-08	my going to get my story book	ˈmaɪˈgoʊɪŋˈtuːˈgɛtˈmaɪˈstɒɹiːˈbʊk	maɪ [*] gʊɪŋ tə gɛt maɪ stɔri bʊk	s+obs-I	1	2;06.14
1969-11-19	have a spoon	ˈhævəˈspuːn	hæv ə spuːn	s+obs-I	1	2;06.25
1969-12-18	can stay	ˈkænˈsteɪ	kæn steɪ	s+obs-I	1	2;07.23
1969-12-31	don't let it stop	ˈdɑntˈlɛtˈɪtˈstɑp	dəʊnt lɛt ɪt stɒp	s+obs-I	1	2;08.06
1969-12-31	let it stop	ˈlɛtˈɪtˈstɑp	lɛt ɪt stɒp	s+obs-I	1	2;08.06
1970-01-02	squeeze and a cuddle	ˈskwiːzˈændəˈkʌdəl	kwiːz [*] n̩ ə kʌdl̩	s+obs-I	-	2;08.08
1970-01-11	we going to Sunday school	ˈwiːˈgoʊɪŋˈtuːˈsʌnˌdeɪˈskuːl	wi [*] gəʊɪn tə sʌndeɪ skəʊ"	s+obs-I	1	2;08.17
1970-01-25	Mummy going to school on Monday	ˈmʌmiːˈgoʊɪŋˈtuːˈskuːlˈɑnˈmʌndiː	mʌmi gʊɪn tə kuːl [*] ɒn mʌndeɪ	s+obs-I	2	2;09.00
1970-01-25	Mummy wents to school	ˈmʌmiːˈwɛntsˈtuːˈskuːl	mʌmi wɛnts [*] tə skuːl	s+obs-I	1	2;09.00
1970-02-14	to nursery school today tomorrow	ˈtuːˈnʌɪsəɹiːˈskuːltəˈdeɪtəˈmɑˌɹoʊ	tə nəːsri skuːl tədeɪ təmɒrəʊ	s+obs-I	1	2;09.20
1970-02-14	make stairs	ˈmeɪkˈstɛɹz	meɪk stɛəz	s+obs-I	1	2;09.20

1970-03-07	I skipped	ˈaɪˈskɪpt	aɪ skɪpt	s+obs-I	1	2;10.10
1970-03-07	that's not skipping	ˈðætsˈnɑtˈskɪpɪŋ	ðæts nɒt skɪpɪŋ	s+obs-I	1	2;10.10
1970-03-07	watch me skip Mummy	ˈwɑʧˈmiːˈskɪpˈmʌmiː	wɒʧ mi skɪp mʌmi	s+obs-I	1	2;10.10
1970-03-15	and that stays in the middle	ˈændˈðætˈsteɪzənðəˈmɪdəl	n̩ ðæt steɪz ɪn ə mɪdʊ	s+obs-I	1	2;10.18
1970-03-23	I say scream	ˈaɪˈseɪˈskɹiːm	aɪ seɪ skiːm [*]	s+obs-I	-	2;10.26
1970-03-23	now stay on the pavement	ˈnaʊˈsteɪˈɑnðəˈpeɪvmənt	naʊ steɪ ɒn ðə peɪvmənt	s+obs-I	1	2;10.26
1970-04-10	my little sticker's here	ˈmaɪˈlɪtəlˈstɪkəɹzˈhɪɹ	mɑ lɪtʊ stɪkəz hɪə	s+obs-I	1	2;11.16
1970-04-10	you wash your stockings tonight on Sunday	ˈjuːˈwɑʃˈjɔɹˈstɑkɪŋztəˈnaɪtˈɑnˈsʌnˌdeɪ	u [*] wɒʃ jɔ ʃtɒkɪŋz [*] tənaɪt ɒn sʌndeɪ	s+obs-I	1	2;11.16
1970-04-10	there's a skipping rope here and a skipping rope there	ˈðɛɪzəˈskɪpɪŋˈɹoʊpˈhɪɹˈændəˈskɪpɪŋˈɹoʊpˈðɛɹ	ðɛəz ə skɪpɪŋ rəʊp hɪə n̩ ə skɪpɪŋ rəʊp ðɛə.	s+obs-I	1	2;11.16
1970-04-10	there's a skipping rope here and a skipping rope there	ˈðɛɪzəˈskɪpɪŋˈɹoʊpˈhɪɹˈændəˈskɪpɪŋˈɹoʊpˈðɛɹ	ðɛəz ə skɪpɪŋ rəʊp hɪə n̩ ə skɪpɪŋ rəʊp ðɛə.	s+obs-I	1	2;11.16
1970-04-25	can Jenny have a spade	ˈkænˈʤeniːˈhævəˈspeɪd	kæn ʤeni æv ə speɪd	s+obs-I	1	3;00.00
1970-10-10	oo it's still not dark	uːˈɪtsˈstɪlˈnɑtˈdɑɹk	uː ɪts stɪl nɒt dɑk	s+obs-I	1	3;05.15
1970-11-22	please may I have a straw	ˈpliːzˈmeɪˈaɪˈhævəˈstɹɒ	pliːz meɪ aɪ hæv ə strɔː	s+obs-I	-	3;06.28
1970-11-22	it might be not muddy where those steps are	ˈɪtˈmaɪtˈbiːˈnɑtˈmʌdiːˈwɛɹˈðoʊzˈsteps'ɑɪ	ɪt <maɪt bi nɒt> mʌdi wɛə ðəʊz steps ɑ	s+obs-I	1	3;06.28
1968-12-27	dustbin man	ˈdʌstˌbɪnˈmæn	dʌpɪn mæn	s+obs-M	4	1;08.02
1969-04-10	biscuit please	ˈbɪskətˈpliːz	bɪskɪt piːs [*]	s+obs-M	1	1;11.16
1969-04-10	basket another	ˈbæskətəˈnʌðəɹ	bɑːskɪt lɛləʊ	s+obs-M	1	1;11.16
1969-04-10	chocolate biscuit	ˈʧɒklətˈbɪskət	kɒki bɪskɪt	s+obs-M	1	1;11.16

1969-04-10	upstairs Suki	əpˈstɛɹzˈsuːkiː	ʌpstɛəz suːki	s+obs-M	1	1;11.16
1969-04-13	Easter egg	ˈiːstəɹˈɛg	<iːstɛg> [*]	s+obs-M	1	1;11.19
1969-04-13	mine's basket	ˈmaɪnzˈbæskət	maɪnz bɑːskɪt	s+obs-M	1	1;11.19
1969-04-13	more biscuit	ˈmɒɹˈbɪskət	mɑː biskɪt	s+obs-M	1	1;11.19
1969-04-22	chocolate biscuit	ˈʧɒklətˈbɪskət	kɒki bɪskɪt	s+obs-M	1	1;11.28
1969-04-27	another biscuit	əˈnʌðəɹˈbɪskət	lɛləʊ bɪskɪt	s+obs-M	1	2;00.02
1969-05-11	downstairs	ˌdaʊnˈstɛɹz	daʊndɛə [*]	s+obs-M	2	2;00.16
1969-05-13	disgusting Daddy	ˌdɪsˈgʌstɪŋˈdædiː	gʌstɪn [*] dædi	s+obs-M	4	2;00.18
1969-05-13	disgusting Daddy	ˌdɪsˈgʌstɪŋˈdædiː	gʌstɪn [*] dædi	s+obs-M	1	2;00.18
1969-04-27	biscuit	ˈbɪskət	biskɪt	s+obs-M	1	2;00.2
1969-05-26	like biscuits	ˈlaɪkˈbɪskəts	laɪk bɪskɪts	s+obs-M	1	2;01.01
1969-05-26	more biscuits	ˈmɒɹˈbɪskəts	mɑː bɪskɪts	s+obs-M	1	2;01.01
1969-05-26	see Cynthia yesterday	ˈsiːˈsɪnθiːəˈjɛstəɪˌdeɪ	ʂi ʂanəɪə jɛstədeɪ	s+obs-M	1	2;01.01
1969-06-01	like biscuits	ˈlaɪkˈbɪskəts	laɪk bɪskɪts	s+obs-M	1	2;01.07
1969-06-16	biscuits	ˈbɪskəts	bɪskɪts	s+obs-M	1	2;01.22
1969-07-02	downstairs	ˌdaʊnˈstɛɹz	daʊndɛə [*]	s+obs-M	2	2;02.07
1969-07-02	like gooseberry pie now	ˈlaɪkˈguːsˌbɛɹiːˈpaɪˈnaʊ	laɪ buːbi [*] paɪ naʊ	s+obs-M	2	2;02.07
1969-08-20	downstairs	ˌdaʊnˈstɛɹz	daʊntɛəz [*]	s+obs-M	2	2;03.26
1969-08-20	those are bannisters	ˈðoʊzˈɑɹˈbæniztəɹz	dəʊz ə bænɪstəz	s+obs-M	1	2;03.26
1969-08-30	mine's a big girl on Wednesday	ˈmaɪnzəˈbɪgˈgʌɹlˈɑnˈwɛnzdiː	maɪnz [*] ə bɪg gəːl ɒn wɛnzdeɪ	s+obs-M	1	2;04.05

1969-09-21	my like to go downstairs	ˈmaɪˈlaɪkˈtuːˈgoʊˌdaʊnˈsteɪz	maɪ laɪk ə gəʊ daʊnsteəz	s+obs-M	1	2;04.27
1969-09-21	like to go downstairs	ˈlaɪkˈtuːˈgoʊˌdaʊnˈsteɪz	laɪk ə gəʊ daʊnsteəz	s+obs-M	1	2;04.27
1969-10-07	me like some biscuits	ˈmiːˈlaɪkˈsʌmˈbɪskəts	mɑ [*] laɪk səm bɪskɪts	s+obs-M	1	2;05.12
1969-10-10	that's a big basket	ˈðætsəˈbɪgˈbæskət	dæs [*] ə bɪg bɑːskɪt	s+obs-M	1	2;05.15
1969-10-17	my like my basket	ˈmaɪˈlaɪkˈmaɪˈbæskət	maɪ [*] laɪk maɪ bɑːskɪt	s+obs-M	1	2;05.22
1969-11-19	have a teaspoon	ˈhævəˈtiːsˌpuːn	hæv ə tiːspuːn	s+obs-M	1	2;06.25
1969-12-18	member where my basket is	ˈmɛmbəɹˈwɛɹˈmaɪˈbæskətˈɪz	məmbə [*] weə maɪ bɑskɪt ɪz	s+obs-M	1	2;07.23
1969-12-31	my had a drink of water upstairs	ˈmaɪˈhædəˈdɹɪŋkˈʌvˈwɒtəɹəpˈsteɪz	maɪ [*] hæd ə drɪŋk ə wɔtə ʌpsteəz	s+obs-M	1	2;08.06
1970-01-01	a biscuit now	əˈbɪskətˈnaʊ	ə bɪskɪt naʊ	s+obs-M	1	2;08.07
1970-01-01	getting those newspapers	ˈgɛtɪŋˈðoʊzˈnuːzˌpeɪpəɹz	gɛtɪŋ ðəʊz nuːzpeɪpəz	s+obs-M	1	2;08.07
1970-01-01	mine's not reading those newspapers	ˈmaɪnzˈnɑtˈɹɛdɪŋˈðoʊzˈnuːz ˌpeɪpəɹz	maɪnz [*] nɒt riːdɪŋ ðəʊz nuːzpeɪpəz	s+obs-M	1	2;08.07
1970-01-02	I did saw it upstairs	ˈaɪˈdɪdˈsɒˈɪtəpˈsteɪz	aɪ dɪd sɔːr [*] ɪt ʌpsteəz	s+obs-M	1	2;08.08
1970-01-25	Mummy did go on Thursday	ˈmʌmiːˈdɪdˈgoʊˈɑnˈθʌɪzˌdeɪ	mʌmi dɪd gəʊ ɒn əəsdeɪ	s+obs-M	1	2;09.00
1970-02-01	to do a upstairs	ˈtuːˈduːəəpˈsteɪz	tu du ə wiwi ʌpteəz [*]	s+obs-M	2	2;09.07
1970-02-01	Lucky wants to go to hospital	ˈlʌkiːˈwɑntsˈtuːˈgoʊˈtuːˈhɑsˌpɪtəl	lʌki wɒnts tə gəʊ tə hɒspɪtl̩	s+obs-M	1	2;09.07
1970-03-07	Mummy's going upstairs	ˈmʌmiːzˈgoʊɪŋəpˈsteɪz	mʌmiz gəʊɪŋ ʌpsteəz	s+obs-M	1	2;10.10
1970-03-07	I go to the escalator	ˈaɪˈgoʊˈtuːðəˈɛskəˌleɪtəɹ	aɪ gəʊ tə ðə æskəleɪtə	s+obs-M	1	2;10.10
1970-04-02	that one's tasty	ˈðætˈwʌnzˈteɪstiː	ðæt wʌnz teɪsti	s+obs-M	1	2;11.08
1970-04-02	take the tasty out	ˈteɪkðəˈteɪstiːˈaʊt	teɪk ðə teɪsti aʊt	s+obs-M	1	2;11.08

1970-07-05	I just losted it under the chair	ˈaɪˈʤʌstˈlɒstɪdˈɪtˈʌndəɹðəˈʧɛɹ	aɪ dʒəst lɒstɪd [*] ɪt ʌndə ðə tʃɛə s+obs-M	1	3;02.10

APPENDIX B

Age at Cluster Acquisition

Goad corpus

David

Cluster	Date of Acquisition
br	3;03.21
pl	3;05.26
sp	3;05.26
bl	3;07.13
kl	3;07.13
sl	3;07.13
tr	3;07.13

Mark

Cluster	Date of Acquisition
br	3;03.21
tr	3;03.21
sk	3;04.26
pl	3;05.26
dr	3;07.13
fr	3;07.13
kl	3;07.13
pr	3;07.13
sl	3;07.13
st	3;07.13
sw	3;07.13

Cruttenden corpus

Jane		**Lucy**	
Cluster	Date of Acquisition	Cluster	Date of Acquisition
gr	2;03.26	kr	2;00.02
br	2;04.05	dr	2;00.09
sl	2;05.22	br	2;01.01
sw	2;07.00	sn	2;02.07
dr	2;07.23	bl	2;03.13
kl	2;07.23	kl	2;03.26
kr	2;07.23	pl	2;03.26
bl	2;08.06	sl	2;03.26
gl	2;08.06	sp	2;03.26
sm	2;08.07	st	2;03.26
pl	2;08.17	θr	2;03.26
sk	2;08.17	fl	2;04.05
fl	2;09.20	tr	2;04.05
fr	2;09.22	sw	2;04.19
pr	2;10.26	gr	2;05.15
st	2;11.16	fr	2;06.25
tr	3;00.00	pr	2;08.07
		sk	2;08.17
		sm	2;09.18
		gl	2;09.20