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CONTENTS

THE IMPORTANCE OF PHONETIC DATA
IN ALL CHILD LANGUAGE ANALYSES

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1. Introduction

In the past ten to fifteen years, a great deal of work has been done in the
study of child language and language acquisition. In the area of syntax and
semantics, in particular, considerable concern has been expressed for finding
analyses which grow out of the data collected, rather than superimposing a
particular model and molding the data to fit the desired model. This concern
was what led to the original formulations of pivot grammar (the first real
attempt to depart from the adult model) by Braine (1963), Brown and Fraser
(1963), Miller and Ervin (1964), and McNeill (1966). It led further to Bloom's
(1970) and Schlesinger's (1971) respective theories of underlying elements,
and, subsequently, to Brown's (1973) theory of the major semantic roles for
the early stages of language acquisition.

Despite the very careful work of these and other investigators, however, there
are hardly any studies dealing with syntax or semantics in which the investi-
gator really allows his analysis to emerge entirely from the data, for in
most cases the phonetic characteristics of the utterances are ignored. Though
the realms of syntax and semantics are often seen to be inter-dependent, the
bearing that a phonological analysis or phonetic data might have on syntactic
and semantic analyses is usually overlooked. In this paper I would like to
argue that in attempting a syntactic or semantic analyses of a child's utter-
ances, one should not and, indeed, cannot ignore the phonetic makeup of those
utterances.

In studies in which data are collected with a view to analyzing them syntac-
tically or semantically, the utterances are usually interpreted on the spot
and are written down in normal spelling. Even though written and taped pho-
netic recordings are at times kept,[1] analysis is most often carried out on
those words and word combinations which have been written down or are discern-
nable from the tape. What an investigator listens for are utterances that
can be recognized as words of the adult language. If a particular utterance

is similar enough to the adult model, and the context fits, that utterance
is accepted as being composed of the child's version of those words of the
adult speech. The effect is that the researcher is doing exactly what most
have been trying to avoid. He is superimposing a model "a priori" on the
data. That model is the "adult word" model. The automatic interpretation
of the sound sequences produced by the child as words of the adult model can,
at the least, lead to the inaccurate identification of morphemes present in
the child's speech or to the omission of morphemes from a transcript. Either
error yields inexact syntactic-semantic, or relational, analyses, and the
former can also hinder studies of word meaning. The abondonment of the adult
word model and utilization of phonetics-based data should also illuminate
the extent to which syntactic output and word use are dependent on phonetic
parameters.

2. Data

To support the claim that the phonetic characteristics of children's utter-
ances must be considered in doing any kind of analysis on those utterances,
I will be drawing principally on data collected from the spontaneous pro-
duction of my daughter, Rachel. Some four hundred random utterances were
collected in phonetic transcription between the ages of 1;6 (one year, six
months) and 2;5. Utterances were written down entirely in phonetic transcrip-
tion whenever I was reasonably sure of the phonetic chracteristics of those
utterances. Whenever I was certain of the meaning but unsure of the pho-
netic chracteristics of part of an utterance, that part was written in nor-
mal English spelling. In addition to these data from Rachel, I will be draw-
ing on utterances I have collected from my son, Jaime, and three friends, Eva,
Kirsten, and Julio.

3. Morpheme Identification

Not all of a child's utterances are exactly the same phonetically as their
counterparts in the speech of the adults around him. If an investigator
stops to examine the phonological differences between the child's utterances
and those of an adult closely, he can more accurately identify morphemes
present in the child's speech. Many phonological studies of child language
are available in the literature.[4] But not only the phonologist should be
interested in them; such analyses are also of great use in studies not di-
rectly concerned with phonology.

One useful method for determining exactly how the child's utterances differ
phonetically from the adults' is to draw up a set of phonological rules. In
these rules the investigator can use the expected adult systematic phonetic
versions as the underlying forms for the utterances he has collected from his
child informant. These rules will tell him exactly what differences he should
take into account when he is determining the morphemic makeup of the child's
utterances. Let me make it clear that by advocating the use of the compara-
ble adult form as the underlying form for the child's utterance, I do not
mean to imply necessarily that this underlying form is in any way real

to the child, that it has any relationship whatsoever to the perceptual or hypothesized form of that utterance that is in the child's mind. Nor am I implying that the changes wrought on the adult underlying form are due to difficulties of production or to imperfect perception. Though these are important questions, they need not be dealt with when using this approach as a tool to aid in accurate morpheme identification. This approach is designed to improve one's awareness of the systematic differences that hold between the adult and child models. The discovery of these differences yields important information to the investigator.

To illustrate with the data from Rachel, the following phonological substitution rules (Table I) can be drawn to show processes affecting underlying /D/[5], /ð/, /č/, /ǰ/, /l/, and /r/ in Rachel's speech from 1;8 to 1;11.

Table I

Rules:		Examples:		
1. ð → d / #__		1;9	dιΦwʌntuw	"this one too"
		1;10	*like* dæt	"like that"
2. l → d / V__V		1;10	kʌdə	"color"
		1;10	hədo	"hello"
		1;11	bɑdiy	"barley"
(ð → d / V__V)[6]		2;0	dersnʌdərwʌn	"there's 'nother one"
3. l,D → n / [+Nasal] (V)__		1;9	noni	"naughty"
		1;10	may næp	"my lap"
ð → n / [+Nasal]__		1;10	*open* nʌ *door*	"open the door"
4.[7] l , r → ø / #C__		1;9	pe·t	"plate"
		1;9	siypιn	"sleepin'"
		1;10	bʌš	"brush"
5. l → {w / ø} / V__{# / C}		1;9	hɛwp	"help"
		1;9	ʔιhΦɛwdaw̃	"it fell down"
		1;10	*I* fɛdaw̃	"I fell down"
		1;10	mιwk	"milk"
6.[8] r → w / V__V		1;9	ə̃ səwi	"I'm(?) sorry"
7.[9] V+r → {ə / Və / V / V·} / __{# / C}		1;10	hiə	"here"
		1;11	ə̃ bʌšohɛ	"I?/want? brush your hair"
		1;11	tɛbə	"Teddy Bear"

8. $r \rightarrow \begin{Bmatrix} m \\ w \end{Bmatrix} / \#\underline{}$

at 1/10 ½:

$r \rightarrow \begin{Bmatrix} m \\ w \\ r \end{Bmatrix} / \#\underline{}$

9.[10] $\check{c} \rightarrow t / \#\underline{}$

$\check{\jmath} \rightarrow d / \#\underline{}$

1;9 mop	"robe"
1;10 makobeybіy	"rock-a-bye-baby"
~ bakobeybіy	
1;11 raipɛn	"write pen"
~waipɛn	
~maipɛn	
1;9 təə	"chair"
~tɛə	
1;9 dιn	"Gin"
1;9 dɛf	"Geoff"
1;9 dəimis	"Jaime's"

These rules with their affected and resultant forms are shown schematically in Table II below.

Table II

Affected Segments	$\#\underline{}$	$\#C\underline{}$	$V\underline{}V$	$V\underline{}\begin{Bmatrix} \# \\ C \end{Bmatrix}$	$[+N] (V)\underline{}$
D					$n^{(3)}$
ð	$d^{(1)}$		$d^{(2)}$		$n^{(3)}$
č	$t^{(9)}$				
ǰ	$d^{(9)}$				
l		$\phi^{(4)}$	$d^{(2)}$	$\begin{Bmatrix} \phi \\ w \end{Bmatrix}^{(5)}$	$n^{(3)}$
r	$\begin{Bmatrix} m \\ w \\ r \end{Bmatrix}^{(8)}$	ϕ	$(ə)w^{(6)}$	$\begin{Bmatrix} ə \\ Və \\ V \\ V\cdot \end{Bmatrix}^{(7)}$	

(Note: Numbers in parentheses refer to numbers of above rules.)

The systematization of the child's "errors" in the form of phonological rules illuminates some very significant facts. Most importantly, several of the adult phonemic contrasts are neutralized in the child's speech. Note that, here in initial position, [d] may correspond to any of three adult phonemes, /d/[11], /ǰ/, or /ð/; [t] may correspond to /t/[11] or /č/; [m] may correspond to /m/[11] or /r/; and [w] may correspond to /w/[11] or /r/. Intervocalically, [d] may correspond to /d/[11], /ð/, /ǰ/[10], or /l/, and in the environment of a nasal, [n] may correspond to /n/[11], /D/, /l/, or /ð/. In these environments, and in the others listed, contrasts for the adult may be identical sounds in the child's speech. What would be minimal pairs for the adult may be homophonous for the child. For example, if the child making the above substitutions tried to say "though" and "Joe," both words would sound like [do] (Rules 1 and 9). If the investigator is aware of these possible neutralizations, he will take extra care in interpreting an utterance like [do] morphemically and semantically.

In the analysis of Rachel's speech, there are several instances where knowledge of these phonological substitutions helped to prevent incorrect identification of morphemes. In one case, Rachel was told, "Pull it out," in reference to pulling a small chair out from the middle of a pile of toys. She responded [podɪdawt](1;11). Since this sounds like "put it out," without an awareness of Rule 2 above, it would be natural to begin wondering why she had changed "pull" to "put." In reality, she was almost certainly repeating "pull it out." Similarly, one evening when her brother, Jaime, refused to kiss Rachel goodnight, she was held up to a picture of herself and Jaime to kiss the Jaime in the picture instead. After kissing Jaime, she said [mitu] and proceeded to kiss herself in the picture too. I first interpreted this as "me too," but later I suspected that, in accordance with Rules 8 and 9 above, this was not "me too," but rather "Rachel." My suspicions were confirmed by the fact that no other occurrences of "me too" were observed, and by the subsequent development of the form for "Rachel." With the elimination of Rule 9 around 1;10, "Rachel" was pronounced [mičəw] ~ [meyčəw], and eventually, when word-initial /r/ was always [r], it became [reyčo]. Until we conscientiously make use of phonetic data as a starting point in all analyses, we can not be sure just how often morphemes are misinterpreted in the way suggested by these examples.

Just as an awareness of the phonological rules which are operating at a particular stage can aid in morpheme identification, knowledge of the phonetic development of a particular word or phrase can also be enlightening, especially for semantic studies. One very interesting case of word-development during this period is that of the word "flush." Several phenomena were observable at the time this word was first produced. (1) No consonant clusters with [l] or [r] were produced. (2) In initial consonant clusters, /l/ was always deleted (Rule 4). (3) In a consonant cluster, /f/ was very unstable. Though /f/ was at times produced in these clusters, it was often in free alternation with something else. For example, /fr/ became [p] in "Frosty the Snowman" (See footnote 7.), "no want it puffs" was [no wʌnɪt pʌfs] ~ [no wʌnɪt pʌs] ~ [no wʌnɪt pʌɸs] (1;10). The same "puffs" was also pronounced [pʌps] (1;10, 1;11). And finally, (4) complete assimilation was always possible, as in [ɔn sosʌ] for "on sofa" (1;11), [mɛmiydawn] for "let me down" (1;11), and "look [ɪŋ ɪnnɛr]" (1;11) for "look it's in there." These facts help explain why one of Rachel's first

attempts at "flush" yielded, in succession, [fʌš] → [pʌš] → [pʌšəhɛɛ] → [šʌp]
(1;10), followed by [šʌš] → [šʌtš] **on the same** day. Twelve days later [šʌt]
was recorded, and it is this last form that was used until the emergence of
[flʌš]. Without an awareness of this development, one might be curious as to
why the word "shut" is used here and might hypothesize that "shut" has been
overextended. But knowledge of the development makes one hesitate to assert
that there are associations in the child's mind, for example, between "shutting"
the door and "shutting" the toilet. This is not to say that such a connection
could not be made, especially subsequent to fixing "flush" as [šʌt], which
choice may be due in part to her having heard [šʌt].[12] The point is that at
least at the inception of her use of this word, there probably was not such a
connection. The fact that, with the emergence of [flʌš], this has become [flʌš]
in every instance of "flushing" suggests that there never was such a connection
in her mind between the two [šʌt]'s.

4. Presence, Absence of Morphemes

One of the most intriguing areas of study that has come to my attention through
these data is the phenomenon of unstressed syllable deletion. In some cases the
deleted syllable is not a separate morpheme, but rather part of the adult ver-
sion of a word, while in other cases the syllable which is missing from the ut-
terance would be a separate morpheme. In Table III I have listed the utterances
collected under the two headings "Non-morpheme syllable deletion" and "Morpheme
syllable deletion."

From Table III it can be seen that the types of syllables deleted are similar
in the two cases. Compare, for example, "medicine" and "do it again." In the
first, what for the adult is [mɛDəsɨn] or [mɛDɨsɨn] becomes for Rachel [mɛ·sɨn],
with the unstressed [Də] or [Dɨ] deleted. Similarly, for the adult's [duɨDɨgɨn]
or even [du·Dɨgɨn], Rachel produces [dugɪn], **with the adult's** [ɨDɨ] or [Də] absent.[13]

Table III

A. Non-morpheme syllable deletion:

Utterance		Deleted Syllable
tʰɛ·fo·n	"telephone"	[lə]
ə̃ nʌwʌn bɒk	"want (?) 'nother one book"	[ðər]
yɒ gõ fɔw	"you ('re?) gonna fall"	[nə] ?
mɛ·sɪn	"medicine"	[Də] or [Dɨ]
reyčɒnon	"...Rachel alone"	[lə]
tɛ bə·	"Teddy Bear"	[Di]
kɒtčiz	"cottage cheese"	[əʲ]
kiʔkæt	"kitty cat"	[Di]
ə̃ sɛ̆ʌp hiə	"want (?) sit up here"	[Də]

B.   Morpheme syllable deletion:

Utterance		Deleted Syllable
gɑˬf	in response to J. saying "Rachel wants to get that off"	[ətðæt] ?
pɑtinowmæ̃	"Frosty (the) Snowman"	[ðə]
mɑkobeybiy ~ bɑkobeybiy	"rock-a-(bye)-baby"	[bai]
dugɩn ɛpeyn	"do (it a-) gain. airplane"	[əDə] or [Də]
ə̃ čəp	"want (?) ch(ew it) up"	[ǫəD]
pɑpæn	"pu(t it in the) pan"	[D̶ɨDn̂ðə]
kʌmʌp	"cu(t 'e)m up"	[Də]

How should an investigator interpret the latter group of utterances to deter-
mine what morphemes are present, and how should he treat the subsequent inser-
tion of the unstressed syllable into those utterances? It is probable that the
syllables are deleted in both cases for the same reason, which might involve
either faulty perception or difficulty in production. If it is true that there
is a single cause for both, this will affect any interpretation of the child's
subsequent insertion of the morpheme syllables into the phrases where they
were previously absent. The insertion may not be due to the child's sudden
awareness of the morpheme he has inserted or to a sudden ability to manage
this morpheme syntactically, but rather merely to a new ability that is tied
to the phonetic characteristics of the syllable. (Again I want to emphasize
that if the absence and subsequent insertion of syllables in both cases is
phonetics-related, this still does not settle the question of whether the ab-
sence of the syllable is due to imperfect perception or constraints on produc-
tion.)

It is of significance, both for analyses of these utterances and for what light
it may shed on the roles of stress and word structure in the acquisition of
language, that the two types of unstressed syllables emerged concurrently in
Rachel's speech. Within the span of a week (at 2;0), I observed [duɩDɨgɩn]
("do it again"), [dɛrsnʌdərwʌn] ("there's 'nother one"), and [kiDɩkæt] ("kitty
cat"), each spontaneously produced with medial syllables inserted for the first
time. After these had been produced spontaneously, Rachel was asked to re-
peat the following words, and all of them were produced with medial syllables
present:

"do it again"	[duwɩDəgɩn]
"rock-a-bye-baby"	[rɑkəbaibeybiy]
"chew it up"	[čuDʌp]
"Teddy Bear"	[tɛdɩ bɛr]
"Frosty the Snowman"	[fɔstiðəŋowmæ̃] ~ [fɔsigəŋowmæ̃]
"cut 'em up"	[kʌnʌmʌp] ~ [kʌmʌʔʌp]

"telephone"	[tɛ·dəfon]
"I'm gonna fall"	[ai gonə fɔ]

That the two types of unstressed syllables emerged at the same time, however, does not necessarily settle the question of whether their production or lack thereof is phonetics-related. It may be that becoming aware of the morphemes that were absent from the second set of phrases in Table III triggered the production of both these unstressed morphemes and the unstressed syllables that were not morphemes. This seems unlikely, however, for though all the syllables deleted, and then subsequently inserted at the same time, are similar, they are not exactly the same phonetically.

If the absence of unstressed syllables should prove to be due to phonetic causes in both cases, closer examination of a child's utterances in terms of stress patterns and syllable structure will aid our understanding of the roles these play in the process of learning a first language, and will affect analyses of the child's grammar.[14] Such phonetics-related constraints will be particularly important to analyses should they prove to involve production, rather than perception. In this case, the analyst will be forced to include two parts in his grammar -- (1) underlying forms and (2) some type of phonological rules for limitations on utterances, including syllable structure rules and stress constraints. Similar suggestions for describing a child's knowledge in terms of a deep structure which is richer than the surface structure of his utterances have already been proposed by several authors. For example, Ingram (1974) has proposed such a distinction in phonology, Schlesinger (1971) and Bloom (1970) in syntax and semantics.

5. One Final Remark

We have seen above how, by formulating rules to describe the phonetic differences between a child's utterances and an adult's, an investigator can avoid making some mistakes in the syntactic and semantic interpretation of a child's utterances. I believe that there is a byproduct to be gained in the area of phonological investigations by using this same method. This approach may reveal information about underlying phonological forms that are real to the child *or about what a child is perceiving.*

Suppose we want to know if a child perceives two similar adult sounds, A and B, distinctly. Perhaps the child does not produce A at all, and we find words in which he uses sound B where the adult uses A. It is difficult to determine whether he is perceiving A the same as B, or whether he just has difficulty in pronouncing A, so he uses B instead. To determine if A is perceived as different from B, the investigator can look at all cases of (underlying) A and B in the same environment. If he finds that underlying B is always produced as B, or even sometimes as a third sound C, while underlying A vacillates in production between sound B and a fourth sound D (not the same as C), I believe he can be certain that discrimination of some kind is occurring.

An example of this can be found in the data from Rachel. For underlying /r/ word-initially, we find that what for the adult would be [r] is produced as [w] in some words. Kornfeld and Goehl (1974) point out that children with "w/r problems" "appear to be correctly discriminating [r]'s from [w]'s in contexts where they themselves utter an 'unacceptable' segment." (211) And Kornfeld (1971) argues from spectrograms that they are even discriminating them in production, making the [w] sound in the /r/ words differently from that of the /w/ words.

If we accept the reasoning above, then the data collected here supports the view that the child perceives word-initial /w/ and /r/ as distinct sounds. In the data it is striking that the word-initial /r/ segments vacillate between [m], [w], and eventually even [r]. In all but five of the /w/ words, however, until 1;10½, [w] is present. Four of the remaining utterances have ∅ in the /w/ position, and the last has [y], which, like [w], is a glide.

After 1;10½, which is when [r] begins to emerge in all environments where there is an underlying /r/, /w/ becomes [m] word initially three times, in each case preceding a vowel + nasal [n]. Two of these [m] - /w/ words are "want," one of the words most often used, prior to 1;10½, with word-initial [w].

This difference in performance between word-initial /r/ and /w/, plus the fact that, with the emergence of word-initial [r], there was little confusion about which of the [w] words should be corrected to [r], indicate that there must have been some discrimination between the two in the stored forms.

A contrasting example involves inter-vocalic /d/, /l/, and /n/. At the time rules 2 and 3 above were in force, no inter-vocalic [l]'s were produced at all. When inter-vocalic [l] did begin to emerge (around 1;11½), we witness a period of great confusion and overlap among [l], [d], and [n], a confusion which is not restricted to the inter-vocalic environment. Examples are shown in Table IV.

Table IV

/l/

1;11	nɒk	"look"
1;11	fənər	"fooler"
2;0	ɪh may kʌlər	"it's my color"
2;1	ʌnʌ hədo də tɛdəfown	"wanna hello the telephone"
2;1	aɪnat sɪDiy ~ aɪnat sɪliy ~aɪnat sɪDiy	"I('m?) not silly"

/n/

2;0	may luwdo	"my noodle"
	mor nuwdoz	"more noodles"
2;0	*don't wipe* maɪ loz	"don't wipe my nose"
2;1	dɛrs maɪ lʌwã pɪn	"there's my 'nother one pin"
2;1	dɛrs maɪ nʌwã	"there's my 'nother one"
2;1	aɪ wʌnt maɪ luwdoz	"I want my noodles"

/d/
2;0	gɩlɔfdəteybo ˷ gɩtɔfdəteybo	"get off the table"
2;0	teyk may kolɔf	"take my coat off"
2;1	dætіy dætіy	"Daddy Daddy"

The great difference between the relatively unconfused emergence of [r] and the very confused emergence of inter-vocalic [l] (mistakes were still being made sporadically at 2;5.) suggest that there was some discrimination in the former case even before [r] emerged, while in the latter case, discrimination did not occur until, or only very shortly before, the time of emergence. The underlying forms (by which is meant here the ones in the child's head) for the inter-vocalic portions of these words must have had to be revised and relearned.

In short, the method of analysis proposed above as a practical measure to be used in syntactic and semantic analyses may prove valuable in the area of phonological investigation as well. Though it will not indicate exactly in what form items are stored in the child's mind, it can give us a clue as to whether or not discrimination is occurring between two phonemic segments.

6. Conclusion

It is clear that we cannot ignore phonetic output when doing any kind of analysis of children's utterances. Building analyses on phonetic data, we can increase accuracy in morpheme identification and avoid drawing erroneous conclusions about semantic associations a child is making. We must abandon an "adult word" model and take advantage of the insights that a phonetics-based grammatical analysis can afford.

In an attempt to systematize the phonetic data collected, a method of writing phonological rules with the adult systematic phonetic forms underlying the child's forms was used. Though those underlying forms and rules may not be psychologically real to the child, they can make explicit the exact ways in which his utterances differ phonetically from those of the adult. They will serve thus as a guide for the analyst to the correct interpretations of utterances, especially where two or more adult sounds are neutralized in the child's speech. This guide will facilitate correct morpheme identification, which is essential for an accurate grammatical analysis. It will also aid studies of word meaning and overgeneralization by promoting an understanding of cases like [šʌt], where what looks like an overgeneralization might not be a genuine one.

The phenomenon of the absence of both non-morpheme and morpheme unstressed syllables and their concurrent emergence points also to the significance of stress and syllable structure in the format a child's utterance takes. A deeper understanding of this too will affect correct identification of morphemes and can also lead to greater insight into the acquisition of language in general.

And, lastly, phonological rules like those shown here, though designed as a practical aid for accurate syntactic-semantic analyses, might also prove to be a valuable tool for discovering information about the perceptual discrimination and stored models the child has for certain phonological units.

[1]See, for example, Brown (1973), p. 51 - 52.

[2]Often when a child does repeat an utterance the repetitions are pho-
netically distinct. These alternations, of course, must be incorporated into
the phonological analysis made.

[3]For a discussion of the possibility of different tactics being used in
distinct language tasks, see Lois Bloom, "Talking, Understanding, and Thinking."
In Schiefelbusch and Lloyd (Eds.), Language Perspectives: Acquisition, Retard-
ation, and Intervention (Baltimore: University Park Press, 1974), pp. 285-308.

[4]See, for example, David Ingram (1974), Kostas Kazasis (1968), J.R.
Kornfeld (1971), Kornfeld and Goehl (1974), Paula Menyuk (1973), Arlene I. Moso-
witz (1973), and D.L. Olmsted (1971).

[5][D] represents the voiced alveolar flap found in words like "butter"
and "little."

[6]The rule "ð → d / V__V" is included here for the sake of generality
and completeness. Though no instances of intervocalic /ð/ occurred during this
period, it appears later as [d] -- e.g., in [dɛrsnʌdərwʌn], "there's 'nother
one" (2;0).

[7]On a few occasions, #Cr did not reduce to #C. On two occasions /br/
was pronounced [p] (1;9) -- "it's broken, Jaime broken" became [ɪht bo·kɛn --
Jaime po·kɛn], and "brush your hair" became [pʌšəhɛɛ]. /fr/ became [p] in
"Frosty the Snowman": [patinowmæ̃] (1;10).

[8]Rules 6, 7, and 8 begin to drop out just before 1;11, when [r] begins
to emerge in these positions.

[9]/r/ may turn a preceding vowel into [ə] even inter-vocalically -- e.g.,
in [ə̃ səwi].

[10]The frequency of words with underlying /č/ and /ǰ/ is quite low in the
data collected. The rule is stated here as occurring word-initially, but I sus-
pect it would hold in all environments. Discussion of "Rachel" later in the
paper shows it is true at least for V__V. This is parallel to rule 2 above,
where /l/ and /ð/ become [d] inter-vocalically.

[11]These forms are not represented in the above rules, since no change
has occurred.

[12]Note that one of the other transitory forms, [pʌšəhɛɛ] had been used
for "brush your hair," as in footnote 7.

[13]Similar deletions have been noted in several other children I have ob-
served: Julio (2;6) [mosáiko], "motorcycle"; Eva (2;0), [rɪŋəroziy], "ring a-
round the rosy," [ai gɪʔ may sɪpʌdiy], "I get my silly putty," [ʔI sposbiy],

"it supposed to be. . ."; and Kirsten (1;11) [bɛ beə], "Teddy Bear."

¹⁴Slobin (1973) has noted that children pay attention to the ends of words, and Brown and McNeill (1970) have shown that even in adults, the storage and retention of initial and final positions of English words is greater than that of medial portions.

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