The Relationship between Phonology and Inflectional Morphology in an Agrammatic Aphasic

Meryl Kobrin BA (Sp. & H. Therapy) (Witwatersrand)
Lesley Wolk MA (Speech Pathology) (Witwatersrand)
Department of Speech Pathology and Audiology, University of the Witwatersrand, Johannesburg

ABSTRACT
The interaction between phonological and morphological breakdown in an agrammatic aphasic was investigated. Three linguistic tasks were constructed which were presented via two modes, reading and repetition. Results revealed that purely phonological consonant clusters were easier than clusters which contain a morphological component, and that these categories could be differentiated in terms of phonological error type. Inflectional omission was conditioned by phonological characteristics of the preceding segment. There was an interaction between phonological and morphological hierarchies of difficulty in inflections which are homonyms phonologically. Findings suggest an interdependence between phonological and morphological breakdown in the agrammatic aphasic examined. Results were discussed with reference to clinical implications.

OPSOMMING
Die interaksie tussen fonologiese en morfologiese uitvalle in 'n agrammatiese aphasie pasiënt is ondersoek. Drie linguistiese take is opgestel. Die pasiënt moes die take ouditief (deur middel van herhaling) en visueel (deur middel van lees) uitvoer. Resultate dui daarop dat siere fonologiese konsonant groepe makliker was om uit te voer, as groepe wat 'n morfologiese komponent bevat het en dat hierdie kategorieë gedefinieer kon word in terme van sy fonologiese en morfologiese karakteristieke. Die resultate is bespreek met verwysing na kliniese implikasies.

To date, the trend within the psycholinguistic aphasia research has been to focus on the components of language (syntax, semantics and phonology) in isolation, rather than to investigate interrelationships between these levels of linguistic breakdown. The symptomatology of agrammatic aphasic, particularly their tendency to delete inflectional morphemes and their high proportion of phonemic errors, provides a unique opportunity to examine the mutual influence of phonologically and morphologically impaired processes.

Independent research into phonology and inflectional morphology has been well documented. Articulatory investigations have resulted in conflicting opinions as regards the nature of aphasic error performance. Johns and Darley (1970) and Shankweiler and Harris (1973), for example, support the notion that phonemic substitutions are primarily random, variable and unrelated to the target sound. Other investigators suggest that aphasic articulatory errors reflect systematic, rule-governed variations from the target phonemes (Blumstein, 1973; Marquardt, Reinhart and Peterson, 1979).

Studies exploring the performance of agrammatic aphasics in inflectional endings reflect a consistent hierarchy of difficulty for the various morphemes (Goodglass and Berko, 1960; Goodglass and Berko, 1976). De Villiers (1974) contends that explanations such as transformational complexity, semantic complexity, stress, redundancy and frequency of occurrence of each morpheme in normal adult speech are insufficient to explain the hierarchical morphemic impairment. This suggests that alternative explanations should be sought.

A number of theories have been proposed to account for the underlying deficits in agrammatism. Kean (1977) contends that agrammatism is an "interaction between an impaired phonological capacity and otherwise intact linguistic capacities" (p.10). This controversial phonological explanation has subsequently been criticized. Garman (1981) suggests that a number of Kean's arguments are based on misinterpretations of the existing literature. Kolk (1978) argues that although a phonological approach may have value with respect to the 'articulation' impairment in agrammatism, it does not provide a convincing argument to explain the syntactic omissions characteristic of these patients. Goodglass and Berko (1960) take an opposing view to Kean (1977) and suggest that grammatical function is more important than phonological structure in determining the difficulty of an inflectional ending. This theory is based on their finding that the plural, possessive and third person singular inflectional morphemes (all of which are homonyms phonologically) are omitted with differential frequency in agrammatic aphasics (Goodglass and Berko, 1960).

Martin, Wasserman, Gilden, Genatian and West (1975) suggest that neither a purely phonological nor a purely morphological breakdown is sufficient to explain aphasic error performance. They propose that "...it is the interaction of processes which is affected in aphasia rather than a specific impairment of a particular process or component" (p. 449). This interactional model between phonological and morphological impairment has not been confirmed in the aphasia literature. However, several studies in child language have shown an interaction between syntax and phonology (Menyuk and Looney, 1972; Paul and Shriberg, 1982).

The paucity of research into the relationship between linguistic components in aphasia, provided a strong motivation for this study. The broad goal was thus to investigate the inter-relationship between phonological and morphological impairment in the expressive language of an agrammatic aphasic. The specific aims were: 1. To compare the subject's error performance on consonant clusters which are purely phonological constructions (PC); clusters which
are phonological constructions but with morphological possibilities (PCM); and clusters which are morphological combinations (MC). 2. To establish whether the subject's omission of inflectional morphemes is conditioned by the sonorance hierarchy of the preceding segment, as suggested by Kean (1977). 3. To examine the subject's production of three grammatical morphemes which are homonyms phonologically, namely the plural marker, the possessive marker and the third person singular, all of which are realized morphophonemically by the allomorphs /s,z,2/. METHOD SUBJECT The subject used in this study was R. P., a white, South African, English speaking female, aged thirty-eight years. In December 1978, she presented with a sudden onset of expressive aphasia. Computerized tomography revealed a left middle cerebral artery infarct; the etiology of which was unknown. No further neurological details were available. Pre-morbidly, she was right handed. R. P. fulfilled the following criteria:

1. She was a moderately impaired agrammatic aphasic as assessed on the Boston Diagnostic Aphasia Examination (BDAE) (Goldman and Fristoe, 1972).
2. R. P. demonstrated phonemic errors, particularly on consonant clusters.
3. Her expressive language was characterized by omission of inflectional morphemes.
4. Dysarthria and oro-facial apraxia were excluded as being causally related to the phonemic errors.
5. Phonetic discrimination abilities were excluded as being etiologically related to phonemic errors.
6. R. P. demonstrated a competence for the tasks on which she would be expected to perform. More specifically, reading and auditory comprehension abilities, as assessed on the BDAE were sufficiently intact to enable these modalities to be utilized in testing.
7. R. P.'s mother tongue was English.
8. Peripheral hearing and vision were within normal limits.
9. R. P. was neurologically stable during the test period.

TASKS AND PROCEDURE

A. Preliminary Investigations

On the BDAE, R. P. obtained a profile representing Broca's (agrammatic) aphasia. Results served to satisfy some of the criteria for subject selection, specifically her relatively intact receptive language and reading abilities and the presence of phonemic and morphological errors.

The Goldman Fristoe Test of Articulation (Goldman and Fristoe, 1969) R. P. showed several articulation errors on both single phonemes and phonemic sequences, verifying the presence of phonemic and morphological errors.

The subject used in this study was R. P., a white, South African, English speaking female, aged thirty-eight years. In December 1978, she presented with a sudden onset of expressive aphasia. Computerized tomography revealed a left middle cerebral artery infarct; the etiology of which was unknown. No further neurological details were available. Pre-morbidly, she was right handed. R. P. fulfilled the following criteria:

1. She was a moderately impaired agrammatic aphasic as assessed on the Boston Diagnostic Aphasia Examination (BDAE) (Goldman and Fristoe, 1972).
2. R. P. demonstrated phonemic errors, particularly on consonant clusters.
3. Her expressive language was characterized by omission of inflectional morphemes.
4. Dysarthria and oro-facial apraxia were excluded as being causally related to the phonemic errors.
5. Phonetic discrimination abilities were excluded as being etiologically related to phonemic errors.
6. R. P. demonstrated a competence for the tasks on which she would be expected to perform. More specifically, reading and auditory comprehension abilities, as assessed on the BDAE were sufficiently intact to enable these modalities to be utilized in testing.
7. R. P.'s mother tongue was English.
8. Peripheral hearing and vision were within normal limits.
9. R. P. was neurologically stable during the test period.

The Relationship between Phonology and Inflectional Morphology in an Agrammatic Aphasic

3. Phrase/Sentence list of plural, possessive and third person singular

In order to compare R.P.'s production of the plural marker, the possessive marker and the third person singular morpheme, a list of 135 sentences/phrases was compiled (Appendix III). The stimuli were divided into nine groups, so that each allophone /s, z, sz/ of each morpheme was tested fifteen times. Phrases were constructed since the possessive nature of a stimulus cannot be inferred from a single word. For example horse's in a repetition task would be interpreted as a plural. It was felt that a minimum of four syllables was necessary to convey the possessive nature of a stimulus, for example, 'the horse's mouth'. All stimuli therefore comprised four syllables.

C. Administration of Tasks

Each list was administered using two modes of presentation.

1. An auditory mode — repetition
2. A visual mode — reading

Two modes of presentation were selected because the stringent criteria adopted in test construction limited the number of stimuli available in certain groups. Due to the specific nature of the areas being investigated, a spontaneous sample, which may be considered as an ideal medium for linguistic investigation, would not have enabled sufficient sampling of all aspects under study.

For repetition tasks, R.P. was instructed to repeat each item after the experimenter. If no response was given the item was repeated. For reading tasks each item was printed clearly and individually in 10mm capital letters. Word items were printed on 7cm by 9cm cards and phrase/sentence items on 14cm by 9cm cards. Each card was presented singly to R.P. and she was instructed to read it aloud. Testing was carried out on two different days for approximately forty-five minute periods in order to control for fatigue.

D. Analysis Procedure and Scoring

All responses were recorded on a Revox Tape Recorder (model 375 Dolby Version) and subsequently transcribed in broad phonetic script by three independent transcribers. A two out of three consensus was accepted for each word.

Analysis procedure specific to particular tasks

1. CCVCC word list

a) A frequency count of correct versus incorrect initial and final clusters in the three categories was carried out.
b) Phonological errors occurring in final clusters were differentiated according to type, on the basis of two broad categories, namely sequencing and substitution errors. Sequencing errors for the purposes of this study included additions, omissions and metatheses. In instances where a number of phonological errors occurred in one cluster, each was tabulated separately. For example, /st/ —/tz/ was scored as both a sequencing and a substitution error.

2. Sonorance-Inflection word list

A frequency count of morphemes emitted, retained and incorrectly produced was carried out. The incorrect category included instances where R.P. retained a morpheme, but not the particular morpheme under stimulation; for example the allophone /sz/ instead of /s/. Results were expressed as percentages.

RESULTS AND DISCUSSION

Results of R.P.'s performance on each task will be presented individually and overall trends will be discussed in relation to the stated aims of this study.

1. A comparison of R.P.'s error performance on PC, PCM and MC consonant clusters

a) Frequency count of correct versus incorrect consonant clusters

Table 1 Frequency count of correct versus incorrect consonant clusters

<table>
<thead>
<tr>
<th></th>
<th>Initial Cluster</th>
<th>Final Cluster</th>
<th>Initial Cluster</th>
<th>Final Cluster</th>
<th>Initial Cluster</th>
<th>Final Cluster</th>
</tr>
</thead>
<tbody>
<tr>
<td>PC</td>
<td>39</td>
<td>36</td>
<td>41</td>
<td>22</td>
<td>53</td>
<td>28</td>
</tr>
<tr>
<td>PCM</td>
<td>61</td>
<td>64</td>
<td>59</td>
<td>78</td>
<td>47</td>
<td>72</td>
</tr>
<tr>
<td>MC</td>
<td>37</td>
<td>36</td>
<td>41</td>
<td>22</td>
<td>53</td>
<td>28</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 2 Breakdown of correct initial and final clusters

<table>
<thead>
<tr>
<th>Category</th>
<th>Initial Cluster</th>
<th>Final Cluster</th>
</tr>
</thead>
<tbody>
<tr>
<td>PC</td>
<td>39</td>
<td>36</td>
</tr>
<tr>
<td>PCM</td>
<td>41</td>
<td>22</td>
</tr>
<tr>
<td>MC</td>
<td>53</td>
<td>28</td>
</tr>
<tr>
<td>Total</td>
<td>133</td>
<td>86</td>
</tr>
</tbody>
</table>

Table 1 illustrates that R.P.'s incorrect final clusters increased in the progression PC — MC — PCM. Table 2 provides a more specific breakdown of correct clusters. It indicates that within each category, more initial clusters were correctly produced than final clusters. For the purposes of this study, 'difficulty' was conceptualized as the number of incorrect clusters in a category. Martin et al., (1975), in a similar study, conceptualized difficulty as the number of phonemic errors in a particular category. For example 'drink' /'glink' contains two phonemic errors, whereas 'drink' /'grink' contains one phonemic error. Martin et al. contend that the former production reflects greater difficulty than the latter. In this study, any two incorrect clusters were considered as being equally 'difficult',

Die Suid-Afrikaanse Tydskrif vir Kommuniasieafwykings, Vol. 32, 1985
irrespective of the number of phonemic errors occurring in each.

Results of the present study were not entirely consistent with Martin et al.'s (1975) prediction of increased difficulty in the progression PC → PCM → MC. However, the fact that incorrect final clusters increased in the direction PC → MC, supports the contention that due to the added cognitive decision component, a CCVCC word with two morphemes (e.g. dressed) would be more difficult for an aphasic to process than a CCV words which has one morpheme (e.g. trump) (Martin et al., 1975).

The fact that PCM category reflected the highest frequency of incorrect clusters is difficult to explain. It is felt that the PCM category as proposed by Martin et al. (1975) needs careful consideration. Whether in fact the /w/ cluster in a word such as 'breast', for example, is interpreted as a possible morphological combination by the aphasic, is open to speculation. However, results of the present study, suggest that further research into whether the PCM category is conceptualized as a phonological or morphological construction, and whether such a category is in fact valid, could be of value in providing insight into the interaction between these two linguistic components.

The finding that initial clusters are more likely to be correctly produced than final clusters is consistent with that of Martin et al. (1975) who contend that the final cluster position may suggest the possibility of a morphological component which would thus pose a more difficult processing task to the aphasic.

b) Frequency count of sequencing versus substitution errors in final clusters

Table 3 clearly illustrates that the three categories are distinguishable on the basis of error type. The PC category reflects a greater proportion of substitution versus sequencing errors; PC a greater proportion of sequencing versus substitution errors; and PCM an approximately equal distribution of both.

The distribution of error types supports the contention that "... the substitution error is more indicative of a basic phonological impairment, while sequencing errors are more indicative of interactions between the phonological and morphological components" (Martin et al., 1975, p. 446). The approximately equal error distribution in the PCM category, seems to suggest the need for further research into the aphasics' conceptualization of this group as discussed above.

2. Frequency count of omitted inflections as a function of the sonorance hierarchy of the preceding segment

Table 4 represents a summary of morphemes retained, omitted and incorrectly produced, expressed in relation to N. Omission of the morpheme increased in the order V (least omitted) → S → L → N → F (most omitted), where (V), (S), (L), (N) and (F), represent the sonorance category of the final segment of the stem. More inflections were retained following vowels than consonants. Within the consonantal group, the morpheme was most likely to be omitted when preceded by a fricative and least likely to be omitted when preceded by a stop. Kean (1977) hypothesized that omission of the morpheme would increase as the airflow in the articulation of a segment became more impeded, that is in the order V (least omitted) → L → N → F → S (most omitted). This contention was not supported by the present results.

A possible explanation for the finding that the morpheme is more likely to be retained following a vowel than a consonant may be related to the syllable structure of words included in this task. Stem morphemes ending in vowels were of the construction CV (e.g. bee): while those ending in consonants were of the construction CVC (e.g. dog). Addition of the morpheme resulted in CVC stimuli for the vowel category (e.g. bees) and CVCC stimuli for the consonant category (e.g. dogs). Therefore retention of the inflection when the stem ends in a vowel, and omission when it ends in a consonant, may reflect a strategy to maintain the CVC syllable structure form. There is thus clear evidence to suggest that this subject has a tendency to employ simplification processes.

Shankweiler and Harris (1973) suggest that vowels are easier for aphasics to produce than consonants and that within the consonan-
The Relationship between Phonology and Infectional Morphology in an Agrammatic Aphasic

3. Frequency count of retained plural, possessive and third person singular morphemes as a function of their stimulus allophonic realization

Table 5 Distribution of retained plural, possessive and third person singular morphemes as a function of their stimulus allophonic realization

<table>
<thead>
<tr>
<th>Stimulus Allophonic Realization</th>
<th>Plural No.</th>
<th>Possessive No.</th>
<th>Third Person Singular No.</th>
<th>Total No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>/s/</td>
<td>24</td>
<td>13</td>
<td>14</td>
<td>51</td>
</tr>
<tr>
<td>/z/</td>
<td>24</td>
<td>7</td>
<td>8</td>
<td>39</td>
</tr>
<tr>
<td>/az/</td>
<td>30</td>
<td>17</td>
<td>28</td>
<td>75</td>
</tr>
<tr>
<td>Total</td>
<td>78</td>
<td>37</td>
<td>50</td>
<td>165</td>
</tr>
</tbody>
</table>

Table 5 clearly illustrates that the frequency of morpheme retention increases in the progression: possessive (least retained) → third person singular → plural (most retained). The frequency of allophonic retention increases in the progression /z/ (least retained) → /s/ → /az/ (most retained). This pattern is maintained for each individual inflection, with the exception of plurals where /s/ = /z/.

An interactional analysis reveals that:
- Third person singular /az/ is better retained than plurals /s/ and /z/.
- Possessive /az/ is better retained than third person singular /s/ and /z/.
- Possessive /s/ is better retained than third person singular /az/.

Morphological Complexity

The hierarchy of grammatical difficulty exhibited by R.P. is consistent with reports in the literature (De Villiers, 1974; Goodglass, 1976).

Phonological Complexity

For the purposes of the present study, any realization of the allophone was tabulated as a retention of the stimulus allophone. This phonological scoring procedure precluded strict comparison with other writers, who considered the allophone as either correct or incorrect. However, the fact that R.P. retained the syllabic allophone /az/ with greater frequency than any non-syllabic form /s,z/ is consistent with the findings of Goodglass (1976) and in opposition to those of De Villiers (1974). Goodglass (1976, p. 250) attributes the greater retention of the syllabic form /az/ to the added ‘saliency’ of the extra syllable. He states that: “there is no basis at present for anything but a first order intuitive definition of saliency as the result of information, load, affective tone, increased amplitude and intonational stress” (Goodglass, 1976, p. 253). It is clear that this definition of saliency, includes both receptive and expressive components. Therefore, if saliency, as delineated above by Goodglass (1976), were the sole explanation for the present findings, greater retention of the voiced /z/ as opposed to the unvoiced /s/ would have been expected, particularly on repetition tasks. However, the fact that R.P. showed greater retention of /s/ as opposed to /az/ suggests that alternative explanations, possibly with phonological implications should be sought. Wolk (1978) reported that voiced fricatives may be more susceptible to error in aphasics than their voiceless cognates, which may explain R.P.’s greater retention of the stimulus allophone /s/ as opposed to /az/.

Whilst some explanations have been provided, a more complete account of the above findings would involve detailed consideration of receptive language and perceptual factors, which is felt to go beyond the scope of this study. However, R.P.’s differential retention of the stimulus allophones /s/ and /z/ suggests that further research into receptive language and phonemic perception in agrammatic aphasics, may provide valuable information.

Interactional Analysis

The finding that syllabic forms of more complex morphemes are more likely to be retained than non-syllabic forms of less complex morphemes, provides strong evidence for an interaction between apparent phonological and morphological hierarchies of difficulty.

MAJOR TRENDS

Overall, the following trends exhibited by R.P. in this study, suggest an interdependence between the phonological and morphological levels of breakdown for this case:

a. Consonant clusters of purely phonological construction were more likely to be correctly produced than clusters containing a morphological component or suggesting the possibility thereof.

b. The cluster categories PC, PCM and MC were clearly differentiated in terms of the proportion of sequencing versus substitution errors. PC reflected a greater proportion of substitution errors, MC a greater proportion of sequencing errors and PCM an approximately equal distribution of both.

2. Inflectional deletion appeared to be conditioned by phonological characteristics of the preceding segment as well as the syllabic structure of the word.

3. There was an apparent interaction between the grammatical and phonological hierarchies of difficulty in three morphemes which are homonyms phonologically.

CONCLUSIONS

Results of this study reflect a mutual interdependence between the phonologically and morphologically impaired systems of this agrammatic aphasic patient. Such findings contradict the notions that agrammatism is a uniquely phonological deficit (Kean, 1977) or that it is a disruption of the syntactic component of language co-occurring with an independent disorder of articulation (Berndt and Carman, 1981, p. 171). An interactional model between phonology and morphology, suggesting a unitary linguistic representation is strongly
indicated. Verification of the present trends on a large group of agrammatic aphasics may support the contention that there is no single impairment at a specific level in agrammatism. Rather, a complex interaction of linguistic processes, all of which are operating at a reduced level of efficiency would be indicated (Martin et al., 1975). Such a model highlights the inherent limitations of fragmenting the linguistic components in the treatment of agrammatism and suggests a number of clinical implications for the aphasiologist. Firstly, diagnostic procedures could possibly include a description of morphological breakdown in the context of phonological breakdown, rather than two detailed but separate analyses. Secondly, phonological environments conditioning the omission of inflectional morphemes should be evaluated for each patient and therapy could proceed from phonologically simpler to more complex contexts.

Further research into the relationship between linguistic components in both aphasia and child language disorders is indicated. This would not only facilitate a more holistic approach to the management of these patients, but would provide greater insight into the organization of language components in a linguistically intact system.

REFERENCES


Goodglass, H., & Kaplan, E. The Assessment of Aphasia and Related Disorders. Boston Veterans Administration Hospital and Aphasia Research Centre, Department of Neurology, Boston University, 1972.


APPENDIX I

CCVCC WORD LIST

<table>
<thead>
<tr>
<th>blank</th>
<th>frank</th>
<th>clap</th>
<th>cramp</th>
<th>drench</th>
<th>shrink</th>
<th>grange</th>
<th>stump</th>
<th>trump</th>
<th>speak</th>
</tr>
</thead>
<tbody>
<tr>
<td>blink</td>
<td>brisk</td>
<td>clench</td>
<td>crunch</td>
<td>drunk</td>
<td>French</td>
<td>plea</td>
<td>stick</td>
<td>clamp</td>
<td>spout</td>
</tr>
<tr>
<td>branch</td>
<td>clamp</td>
<td>clump</td>
<td>crimp</td>
<td>flack</td>
<td>frisk</td>
<td>scalp</td>
<td>plump</td>
<td>shrimp</td>
<td>trench</td>
</tr>
</tbody>
</table>

PHONOLOGICAL CONSTRUCTION WITH MORPHOLOGICAL POSSIBILITIES (PCM)

<table>
<thead>
<tr>
<th>blind</th>
<th>breast</th>
<th>cleft</th>
<th>cross</th>
<th>friend</th>
<th>glouce</th>
<th>ground</th>
<th>scant</th>
<th>stand</th>
<th>trance</th>
</tr>
</thead>
<tbody>
<tr>
<td>blind</td>
<td>breaze</td>
<td>crouch</td>
<td>draft</td>
<td>front</td>
<td>fright</td>
<td>plant</td>
<td>scant</td>
<td>stand</td>
<td>trance</td>
</tr>
<tr>
<td>blunt</td>
<td>brunt</td>
<td>great</td>
<td>flex</td>
<td>count</td>
<td>grand</td>
<td>prince</td>
<td>spend</td>
<td>stant</td>
<td>gant</td>
</tr>
<tr>
<td>brand</td>
<td>crease</td>
<td>crest</td>
<td>flex</td>
<td>fluent</td>
<td>grid</td>
<td>print</td>
<td>splot</td>
<td>olfr</td>
<td>line</td>
</tr>
</tbody>
</table>

PHONOLOGICAL CONSTRUCTION WITH MORPHOLOGICAL COMBINATION (MC)

<table>
<thead>
<tr>
<th>rogs</th>
<th>tricks</th>
<th>apon</th>
<th>foams</th>
<th>noosed</th>
<th>rubbed</th>
<th>dressed</th>
<th>crust</th>
<th>bread</th>
<th>bricks</th>
</tr>
</thead>
<tbody>
<tr>
<td>planes</td>
<td>play</td>
<td>sides</td>
<td>planned</td>
<td>flipped</td>
<td>crossed</td>
<td>crossed</td>
<td>crossed</td>
<td>crossed</td>
<td>crossed</td>
</tr>
<tr>
<td>steps</td>
<td>moves</td>
<td>closed</td>
<td>closed</td>
<td>closed</td>
<td>closed</td>
<td>closed</td>
<td>closed</td>
<td>closed</td>
<td>closed</td>
</tr>
</tbody>
</table>

The Relationship between Phonology and Infectional Morphology in an Agrammatic Aphasic

APPENDIX II

SONORANCE – INFLECTION WORD LIST

<table>
<thead>
<tr>
<th>VOWELS AND DIPTHONGS</th>
<th>NASALS</th>
<th>FRICTIONALS</th>
<th>STOPS</th>
</tr>
</thead>
<tbody>
<tr>
<td>bees</td>
<td>fees</td>
<td>knees</td>
<td>pass</td>
</tr>
<tr>
<td>fiid</td>
<td>ihed</td>
<td>caed</td>
<td>sohd</td>
</tr>
<tr>
<td>bees</td>
<td>fees</td>
<td>knees</td>
<td>pass</td>
</tr>
<tr>
<td>fiid</td>
<td>ihed</td>
<td>caed</td>
<td>sohd</td>
</tr>
</tbody>
</table>

APPENDIX III

PHRASE/SENTENCE LIST OF PLURAL, POSSESSIVE AND THIRD PERSON SINGULAR

PLURAL /a/
I have big cats
She has two pigs
I bought two jobs
I have two legs
I have big dogs
She has two bags
I bought two wigs
I have two pigs
I bought two wigs
I have two pigs
I bought two wigs
I have two pigs
I bought two wigs

POSSESSIVE /a/
The cat's big paw
Pat's little boy
Kam's big hat
The cat's handle
The pet's delicatessen
The lake's water
The rake's handle
Rick's baby girl
The pope's red robe
The pet's handle

THIRD PERSON SINGULAR /a/
The young boy laughs
The big dog barks
The big dog bites
That young man jokes
The good boy writes
He likes to run
He wants to eat
He puts it on
He takes it out
She says the cake
He eats the cake
He passes the dog
The young man talks
The good boy waits
The white dog barks

Die Suid-Afrikaanse Tydskrif vir Kommunikatiewetenskappe, Vol. 32, 1985

Reproduced by Sabinet Gateway under licence granted by the Publisher (dated 2012)