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Segmental Phonology and Black South African English Speakers: Communicative Success with Standard Dialect Listeners

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DECLARATION

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ABSTRACT

The study investigated the nature of the listener confusion which occurs when Black South African English (BSAE) speakers communicate a list of common English words to speakers of standard South African (StdSAE) English. BSAE and StdSAE subjects were grouped into 10 dyads. BSAE subjects read 120 monosyllabic English words to StdSAE subjects. Written data of StdSAE subjects were analysed to determine patterns of success and failure in the communication of single word items by BSAE subjects. Specific difficulties with vowels, dipthongs and consonants are discussed in terms of their effect on intelligibility. Findings are evaluated in the light of previous research, and in terms of Flege's Speech Learning Model (1987, 1991, 1995). It is suggested that all segmental features of BSAE relate to two distinct levels: a functional (meaning) level and an aesthetic level. This study focussed on the functional level, and aimed to describe the segmental features of BSAE speech which affect meaning. Such a distinction has particular relevance for speech and language therapists who need to have a clear rationale for their work with BSAE-speaking clients. Clinical implications specific to this emerging client group within South Africa are discussed.

Keywords: Black South African English (BSAE), Standard South African English (StdSAE), Nguni, Xhosa, segmental phonology.

INTRODUCTION

In South Africa, English is regarded by many as a language of empowerment for use in education, economics and politics (Marivate, 1993; Mtuze, 1993; Theron, 1993; Wade, 1998). Whilst a fairly large corpus of research into white[1] varieties of English in South Africa has been amassed (Hopwood, 1928; Lanham, 1967, 1978; Lass, 1995), research which has the English of black South Africans as its focus is less well established.

There is a great diversity of "African Englishes[2]" within the country. Hibbert and Makoni (1997) suggest that this reflects not only regional and social variation, but the levels of education to which the speakers have been exposed and more significantly the institutional and historical settings in which South Africans have acquired English. Gough (1996a) notes that whilst variation in the English of black South Africans has not been systematically examined in research, sources for variation include the continuum from educated acrolectal to less educated basilectal varieties, the role of the specific mother tongue and regional features.

Black South African English (BSAE) is the term used to refer to the distinctive dialect used primarily by Black South Africans who are indigenous to this country and whose ancestors' birthplace is pre-colonial Africa (Mesthrie, 1995). These speakers are first language speakers of the Nguni (Zulu, Xhosa, Ndebele and Swati) or the Sotho class of languages (Pedi, Sotho and Tswana)[3]. BSAE is thought to have emerged as a result of "the educational experience of speakers, their culture and lifestyles which encourage code-mixing, a high degree of enclosure which encourages group cohesiveness, religious affiliations, and the overall black political experience in South Africa." (Buthelezi, 1995 p.242).

Census data suggest that less than 0.25% of blacks have English as their first language, and between 30 and 61% of black South Africans have 'some knowledge' of English (Gough, 1996a). Knowledge of English is highest in urban areas and reveals a

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[1] Descriptors of social groups and languages follow Mesthrie (1995) and make use of terms such as white and black without quotation marks or epithets such as 'so –called' or 'formerly known as' but with an awareness of the controversy surrounding the use of such terms.

[2] Following Wade's (1996) practice, this term refers specifically to the English of Black South Africans.

[3] Bantu language names are used in this paper without the noun class marker 'isi', 'se' or 'tsi,' as is the standard linguistic practice (following Wade, 1996).

positive correlation with degree of education (Gough, 1996a). It is estimated that there are now approximately seven million black second language speakers of English in South Africa (Central Statistical Services, 1994), a number already almost more than double that of mother tongue speakers. Wade (1998) suggests that the number of speakers is likely to grow in the short to medium term. The reasons cited are the "unparalleled *instrumental value* currently attached to English in South Africa and ... the largely *positive attitudes* that exist towards the variety." (p.8). Almost 75% of all South Africans have an indigenous African language as their mother tongue (Kaschula and Anthonissen, 1995).

Standard South African English (StdSAE) is the prestige dialect that is spoken by the dominant culture and those who hold economic power. It is the variation of English most suited to act as a language of wider communication in international circles (Kaschula and Anthonissen, 1995). Whilst pluralistic views (e.g. Goldberg, 1993; Proctor, 1994) suggest that no dialect is more correct or more sophisticated than another, the utility of having access to the standard dialect – what Akkinaso (1994) refers to as "Right to Language" – is great. Proctor (1994) suggests that one of the primary reasons that parents send their children to school is to learn to speak or approximate the standard dialect. Since the dismantling of apartheid and the desegregation of state education in 1991, increasing numbers of black children have had access to previously 'whites-only' schools. Here, they are likely to face greater pressure to speak English and to change their accent than in the 'township' schools (Gough, 1996a; see this author for a more complete discussion of the acquisitional context). Results of a study by de Klerk and Bosch (1994) suggest that Xhosa native speakers prefer more standard varieties of English: they rated a native English accent more favourably than a BSAE (Xhosa) accent.

Much of the early research into BSAE has been criticised from a sociolinguistic point of view for its prescriptive focus, and the fact that BSAE has been regarded as a deviation from the local standard in need of correcting. This reflects the fact that many of the studies have been pedagogical in focus. However, speech and language therapists involved with BSAE-speaking clients should be careful not to dismiss these studies since they can, in many cases, offer valuable and much-needed insights into an area about which relatively little has been written. The majority of studies have focused

on the structure of BSAE in terms of lexical, syntactic and phonological features. Lanham's early studies (1962 in Young, 1978; 1963; 1967 and Lanham and Traill, 1965) form the basis for most of the later work on BSAE phonology – much of it unpublished - by authors such as Khumalo (1984), Bowles (1994), Jacobs (1994), van Rooy (1995), Glaser (1995) and Bailey (in Wade, 1996). These studies are discussed in further detail in the literature review that follows. Authors such as Wade (1996, 1998), Buthelezi (1989, 1995) and Gough (1996a, 1996b) have written more generally on linguistic and sociolinguistic features of BSAE, and have created a larger picture in which to contextualise specific phonological aspects of BSAE. Wade (1996) notes that while most of the studies pertaining directly to BSAE are of a limited scope, together they highlight a number of the linguistic features of BSAE and build up a picture of BSAE as an independent variety of English.

There has traditionally been a strong belief that most of the difficulties facing the second language (L2) learner are imposed by his or her first language (L1) (Ellis, 1985). It was assumed that where there were differences between the L1 and the L2, the learner's L1 knowledge would interfere with the L2, and where the L1 and L2 were similar, the L1 would actively aid L2 learning. The process held responsible for this was termed language interference or language transfer, and it refers to deviations from the norms of a language that occur in the speech of bilingual individuals as a result of their familiarity with more than one language (Baetens-Beardsmore, 1986; Lehiste, 1988; Archibald, 1993; Kaschula and Anthonissen, 1995; Gough, 1996b). The term 'interference' has been criticised by some authors (e.g. Gough, 1996b) for having negative connotations, and it has been suggested that 'transfer' is preferable. However, interference remains the dominant term in linguistic texts and is used in this paper.

Interference may occur at a variety of linguistic levels including phonological, morphological, lexical or syntactic levels (Kaschula and Anthonissen, 1995). Authors such as Bialystok and Hakuta (1994) and Baetens-Beardsmore (1986) have observed that many successful second language learners who achieve mastery in terms of lexical and syntactical aspects, struggle to overcome the accent associated with their native language at segmental and suprasegmental levels. Empirical evidence (e.g. McLaughlin, 1978; Wayland, 1997) strongly supports these intuitions. The reasons for the incompleteness of phonetic learning among adults are not well-understood. Age of first

exposure and the amount of L2 experience have frequently been listed as important factors (e.g. Ervin-Tripp, 1974). Neurological maturation is thought to be the primary impetus for the critical period hypothesis initially proposed by Penfield and Roberts (1959, in Ellis, 1985) to account for first language acquisition, and later re-defined by Lenneberg (1967, in Ellis, 1985) to include second language acquisition. This hypothesis states that new forms of speech cannot be perfectly acquired once the critical period has passed, usually around the age of puberty. Flege (1995) points out, however, that even if this is the case it still does not explain why and how L2 learning differs from L1 acquisition, or of what actually causes the difficulties with accent. It also fails to explain why certain aspects of phonology (e.g. suprasegmental features) should be amongst the earliest acquired features of the L1 learner in infancy, but remain problematic for even proficient adult L2 learners.

Van Rooy (1995) suggests that first language interference plays a major, if not dominant role in the acquisition of phonology. Perception of phoneme categories in an individual's native language is the basis for forming phonological categories in the second language (Bialystok and Hakuta, 1994), and when an individual produces the phoneme of the second language, it is subjected to the phonetic rules of the primary language.

Contrastive Analysis was developed as a procedure to identify specific areas of difficulty for L2 learners by establishing the differences between the L1 and L2 (see Ellis, 1985 for a more detailed discussion of Contrastive Analysis). The procedure is designed to yield a list of all linguistic features of the L2 which differ from the L1 and were hence thought to be problem areas. These would then be given primary attention in the teaching of the L2. In the late 1960's, the premises underlying Contrastive Analysis were questioned and it was argued that not all L2 learner errors can be attributed to L1 interference. This argument is certainly appropriate for learning of lexical items and syntactic structures, and today it is generally agreed that errors arise as a result of a combination of factors and not due to one single cause. Ellis (1985) suggests that approximately one third of errors can be attributed to interference. Similarly, Baetens-Beardsmore (1986) cautions that it is doubtful whether every departure from the monolingual standard should be seen as interference and he discusses sociolinguistic features such as code-switching in some detail. Gough (1996b) observes that the

effects of L1 are more pervasive and also more subtle than has been traditionally thought. He suggests that it is a constructive rather than a destructive process, and is a performance phenomenon whereby the learner borrows from the mother tongue to assist in getting a message across. Again, this is logical for lexical and syntactical items but is not wholly applicable to phonology. What is relevant to the present study of phonology is Gough's pragmatic view of language: he suggests that borrowing is successful when communication is a success.

Phonological interference however, remains a persistent yet little understood feature of L2 learning. Hatch (1983 in Baetens-Beardsmore, 1986) describes the different developmental stages in both the elimination and persistence of phonological interference. He notes that individuals articulate more accurately in formal rather than informal situations with an increasing use of L1-determined phoneme substitutes as the speech situation becomes more informal. Authors such as Weinreich (1953) and Ball (1984) have noted that contact between two distinct phonological systems within the bilingual individual can lead to four different scenarios:

1. Underdifferentiation – two sounds of the secondary system are confused because they have no counterparts in the primary system.
2. Overdifferentiation – distinctions relevant in the primary system are imposed onto the sounds of the secondary system unnecessarily.
3. Re-interpretation – a bilingual distinguishes phonemes of the secondary system by features which are relevant in the primary system but are superfluous in the secondary system.
4. Phone substitution – two phonemes are identified as identical in two languages even though their production differs.

While studies such as those of Hatch, Weinreich and Ball (cited above) provide much-needed descriptive data on phonological interference, accounts for what is observed are lacking. Data need to be collected and analysed using a theoretical perspective as a guideline, and this has often been lacking from L2 research (Felix, 1987). More recently, researchers have attempted to account for what Wayland (1997) terms the 'foreign accentedness phenomenon' by looking at the relationship between sounds or phonemes in the sound systems of L1 and L2. One such approach is the Speech Learning Model

developed by Flege (1987, 1991, 1995). This author has hypothesised that contrary to earlier views, sounds that are similar to those in the native language are more difficult to learn than those that are either novel or identical to those in the first language. As the representation of the sound in the native language guides the learning of the second language, it follows that if the sound in the second language is identical to the sound in the native language, there will be no difficulty. Nor is there difficulty when there is nothing in the native phonology to guide the phonetic learning. Difficulty is thought to arise when there is enough resemblance to cause intrusion from the native representation.

Flege's model has been criticised for its inability to account for all second language learners and all languages. Yet, its appeal lies in the ability to predict specific areas of ease and difficulty in pronunciation, and to date it is the most comprehensive model of L2 phonology developed. Wayland (1997) urges that the successful evaluation of this or any other approach to the study of accented speech is contingent upon the availability of adequate descriptive data which characterise the patterns of 'errors' made by L2 learners. Information concerning which sounds are mispronounced as well as the nature of the mispronunciation are equally crucial to researchers.

It is difficult to interpret bilingual speech in functional or phonemic terms because a list of phonemes in the contact languages is insufficient without the distribution and phonetic qualities of the allophones (Baetens-Beardsmore, 1986). The information needed for analysing interference at the phonological level is both the phonetic quality of the phonemes in the two languages concerned and their major allophones as well as their distributional sequence. The following section is concerned with an introduction to these areas in StdSAE, as well as in a common L1 for BSAE speakers in South Africa, the Nguni language, Xhosa. Bailey (in Wade, 1996 p.20) notes that "although the phonology of BSAE reflects mother-tongue influence, the main characteristics of BSAE appear to be common to all speakers irrespective of their mother tongues."

Xhosa

Lanham (1969) and Mowrer and Burger (1991) note that there are 48 Xhosa phonemes in total, and these include 7 vowels and 41 consonants.

Vowels

Vowels include /a/ in BATH,[4] /i/ in FLEECE, /u/ in GOOSE, /ɛ/ in DRESS, and /ɔ/ in LOT[5] (Lanham, 1969, and see Table 1 below). The mid vowels /ɛ/ and /ɔ/ have phonologically conditioned, raised allophones [e] and [o] (Ziervogel, 1976; Gough, 1996a; Wade, 1996). There are no dipthongs.

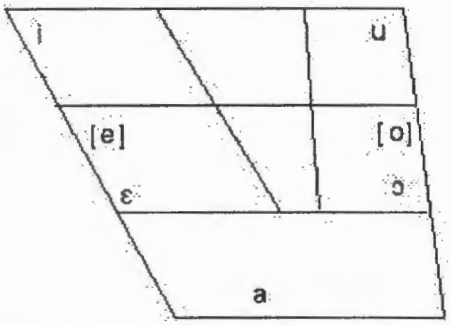

Table 1. The vowel inventory of Xhosa (from Wade, 1996 p.84). Phonemes in square brackets represent raised allophones.

Consonants

Aspiration and ejection are significant features of Nguni phonology. Mowrer and Burger (1991) note that Xhosa uses aspiration and ejection features not only for voiceless plosives but also for voiceless affricates. Xhosa has 9 consonantal features not found in English. These are as follows:

1. Ejective plosives. Voiceless consonants are accompanied by simultaneous glottal closure following articulation of the consonant just prior to production of the following vowel i.e. /p', t', k', ts', tʃ', c', kx'/.

[4] The use of capitalised letters representing words provides a convenient way of referring to phonemic classes in StdSAE and BSAE, following Wells (1982).

[5] IPA symbols used to represent the phonological system of speakers are not intended to indicate the exact phonetic quality of the vowels.

2. Bilabial implosive. During closure of the air passage, air is rarefied by lowering the larynx. Following release of closure, a momentary implosion of air occurs which results in production of a bilabial implosive.
3. Aspirate plosives. Six voiceless consonants are followed by an audible rush of air through the open glottis (/p^h, t^h, k^h, ts^h, $tʃ^h$, c^h/).
4. Velar fricatives. The voiced and unvoiced velar fricatives are produced in the same place as the plosives /k/ and /g/.
5. Lateral fricatives. Two lateral fricatives are produced, one voiced (/ɮ/) and one unvoiced /ɬ/, in addition to the voiced lateral /l/.
6. Pre-palatal nasal. In addition to /m, n, ɲ/, Xhosa speakers produce a pre-palatal nasal.
7. Voiced affricates. Xhosa speakers use two voiced affricates, a palatal and an alveolar, in addition to the prepalatal / dʒ /.
8. Glottal voiced fricative. The voiceless /h/ is not used in Xhosa phonology. Only the voiced counterpart is produced.
9. Clicks. Xhosa clicks are injected consonants, modified when combined with guttural, nasal and palatal components to yield 12 click allophones. (Mowrer and Burger, 1991).

Mowrer and Burger (1991) list 15 consonants which are produced in the same manner as English consonants, and these are: /b, d, g, f, v, s, z, l, m, n, ɲ, dʒ, w, j, ʃ/.

Phonotactics

All syllables in Xhosa are open, i.e. they end either in a vowel or syllabic consonant (Khumalo, 1984). Utterances are almost always initiated and terminated with a vowel, and consonants occupy mainly intervocalic positions (Mowrer and Burger, 1991). Syllable stress always occurs on the penultimate syllable except in the case of ideophones where stress is on the first syllable. Stressed syllables are lengthened. The large range of rising and falling varieties of tones (nine pitches) used in Xhosa gives speech a highly musical sound.

South African English

Lass (1995, following Lanham, 1967) discusses the historical origins and sociolinguistic aspects of StdSAE in some detail. Three varieties of SAE are discussed: extreme SAE, respectable SAE and conservative SAE, and the interested reader is referred to these papers for a comparison between the three types. The discussion that follows focuses primarily on respectable SAE which is described as the local standard used mainly by white middle class speakers, and has also been referred to in studies by authors such as Wade (1996) and Glaser (1995).

Vowels

StdSAE has three types of vocalic nuclei: short vowels, long vowels and dipthongs. Long vowels and dipthongs are approximately the same length (Lass, 1995). The SAE system consists of 12 vowels (see Table 2 below). There are a further eight dipthongs (Wade, 1996) and these are presented in Table 3. Short front vowels in SAE include /æ/ (low vowel in TRAP), /e/ (mid vowel in DRESS) and /I/ (high vowel in KIT). Short back vowels include /ɒ/ (in LOT) and /ʊ/ (in FOOT). Central vowels include /ʌ/ (in STRUT) and /ə/ (/ə/ in COMMA). The long monopthongs include /i:/ (high, front vowel in FLEECE); /ɜ:/[6] (mid-centralised vowel, in NURSE); /u:/ (central and high vowel, in GOOSE); /o:/ (long, back vowel, in THOUGHT) and /ɑ/ (central to back, low vowel in BATH).

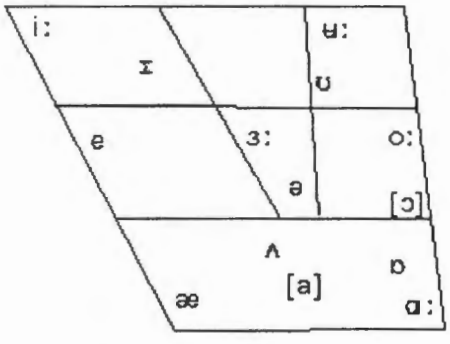

Table 2. Vowel inventory of Respectable SAE (from Wade, 1996 p.84). Phonemes in brackets represent sounds used only in dipthongs.

[6] The phonetic symbols for vowels in NURSE (/ɜ/) and STRUT (/ʌ/) are consistently used throughout this paper to denote the use of both unstressed and stressed phonemes.

Table 3. The eight dipthongs in StdSAE (based on Wade, 1996 p.84).

1. FACE /eɪ/	2. PRICE /aɪ/
3. CHOICE /ɔɪ/	4. NEAR /ɪə/
5. CURE /ʊə/	6. GOAT /ou/
7. MOUTH /ɑu/	8. SQUARE / eə/

Lass (1985) states that the SAE consonantal system can be divided into the following categories:

1. Stops - /p, b, t, d, k, g/
2. Fricatives - /f, v, θ, ð, s, z, ʃ, ʒ, x, h/
3. Affricates - /tʃ, dʒ/
4. Nasals - /m, n, ŋ/
5. Liquids - /r, l, j, w/

Phonotactics

English syllables may be either open or closed and consonants occupy chiefly intervocalic positions. Phonotactically English is more complex than the Nguni languages (Wade, 1996) in that it permits consonant clusters that are not permissible in Xhosa.

Interference in BSAE Phonology: Literature Review

First language interference in the English speech of black South Africans has been widely noted (Lanham, 1978; Gough, 1996a, and see Table 4). Lanham notes that BSAE is characterised by "a distinct accent shared by almost all of its speakers with an obvious origin in the common salient features of Bantu phonology." (p. 23). What we identify as 'accent' is primarily – but not exclusively - due to differences in vowel pronunciation (Lass, 1995; Wade, 1996). The most marked divergence between BSAE and StdSAE is in the vowel systems. The vowel system of StdSAE is reinterpreted by BSAE speakers as a 5 vowel system, thus reducing the number of contrasts. Most of the

consonantal phonemes of StdSAE have equivalents in speakers' L1's. In an early landmark study, Lanham (1962 in Young, 1978) examined the phonology of black South African teachers with the aim of assisting these teachers with their English pronunciation. Lanham found the following four main aspects of mother tongue interference with BSAE which he suggested result in loss of intelligibility:

1. The inability to assign a feature of length consistently to the long vowels e.g. /i:/, /ɜ:/, /o:/, /ɑ:/ and /u:/ and thus to distinguish these vowels from short vowels.
2. The absence of central vowels at mid and high levels (i.e. /ɜ/ and /ə/). Vowel reduction is a phenomenon in English whereby the 'full' form of a vowel changes to a more centralised vowel, typically to /ə/, in unstressed positions (Hawkins, 1984). Since Nguni phonology lacks central vowels, vowel reduction to /ə/ does not occur in BSAE. Lanham described an inability to maintain stress contrasts and most notably to achieve the unstressed /ə/ sound characteristic of StdSAE. /ə/ tends to be realised as a full vowel, typically /ɑ/ or /e/.
3. The inability to distinguish between /e/ and /æ/. Later work by Lanham (1967) suggested that the confusion between front vowels extended to /æ/, /e/ and /ɜ/, all of which were realised as /e/.

Further, it was noted (Lanham and Traill, 1965) that the BSAE accent has an overly tense basis of articulation, and dipthongs such as /eɪ/ and /oʊ/ tend toward monopthongs. For the dipthongs, the /aɪ/, /ɑʊ/ and /ɔɪ/ vowels may be extended over two syllables giving /ajɪ/, /ɑwʊ/ and /ɔjɪ/ respectively.

A literature search reveals that there is little new research in this area until the mid-1980's. One such study is by Khumalo (1984), who describes the way in which English lexical items are incorporated into Zulu, and the way in which English phonology is altered in doing so. Khumalo found that each new (English) vowel was uniformly interpreted as one of the Zulu vowels, but some exceptions were noted and these include the loss of the long-short contrast for the vowels /i/ and /I/ with both realised as /i/; confusion between /e/, /æ/ and /ɜ/ with these vowels being realised mainly as /e/ (again, following Lanham, 1962, 1967); /ʌ/ and /ə/ are absent from the BSAE inventory and realised as /ɑ/; /ɒ/ and /ɔ/ are confused, and /u/ and /ʊ/ are both realised as /u/.

Dipthongs received considerable attention in this study, and Khumalo observes that two English dipthongs are generally interpreted as single vowels: /eə/ in SQUARE is realised as /e/ in DRESS, and /ou/ in GOAT as /o/ in LOT. The other dipthongs are interpreted as two different vowels separated by a glide, in much the same way as Lanham had observed in his earlier studies.

In terms of consonants, Khumalo notes that /θ/ and /ð/ are fricatives that have no Nguni equivalents and are frequently replaced by alveolar stops of the same voicing (i.e. /t/ and /d/ respectively). He writes at some length regarding the representation of English stops and suggests that these present the greatest difficulties because there is a complicated set of rules that governs the co-occurrence of stop types within a morpheme and the sequential constraints that apply to velar stops in Zulu (see Khumalo, 1984). In conclusion this author suggests that the problem of understanding phonemic substitution in linguistic borrowing in Zulu is a complex one. A study of adoptives is a useful way of understanding them.

Lanham (1984) describes prosodic characteristics of BSAE in some depth. The details of his study are interesting, but are not included here since the present enquiry is necessarily restricted to phonology at a segmental level.

Buthelezi (1989) collected *ad hoc* oral language samples in a series of casual observations of BSAE speakers, and describes a range of features – lexical, syntactic and, to a lesser extent phonological - which characterise BSAE. In terms of phonology, it was noted that L1 interference has the greatest effect on vowel length and quality, whilst the consonant system of BSAE differs very little from that of StdSAE.

In a study specifically focusing on consonantal variation in Zulu English, Jacobs (1994) found that the dental fricatives /θ/ and /ð/ are frequently replaced by stops; obstruents (/b/, /d/, /g/, /dʒ/ and /z/) are devoiced especially in word final position, and occasionally the affricate /tʃ/ is replaced by the fricative /ʃ/.

Van Rooy (1995) examined difficulties faced by mother tongue speakers of Afrikaans and Tswana when speaking English, and found word final devoicing to be a predominant process for both groups. He argues that final devoicing is a "universal tendency, a default mechanism used by speakers when dealing with a new language, perhaps." (p.2). This could certainly have implications for the teaching of English in South Africa, and as such may be of relevance to studies of BSAE phonology.

Bowles (1994) and Glaser (1995), in unpublished studies each examined specific vowels and their realisation in BSAE. Bowles observed that the StdSAE vowels /ʌ/ and /ɑ/ are merged to /ɑ/, and the loss of contrast between long and short vowels may be lost so that /i/ and /I/ may both be realised as /i/. This latter observation is in agreement with Khumalo (1984). Glaser (1995) found that the StdSAE vowels /æ/, /e/ and /ɜ/ tend to be merged to /e/. Her findings are in agreement with those of Khumalo (1984) and Lanham (1967).

In another unpublished study, Bailey (in Wade, 1996) examined the BSAE phonology of L1 Zulu speakers in some detail, and again concurred that the most marked divergence between BSAE and StdSAE occurs in the vowel system. He suggests that the vowel system of StdSAE is reinterpreted by speakers of BSAE as a five vowel system. Vowel length in BSAE is not significant and reduction of unstressed vowels to /ə/ typically does not occur. Dipthongs are generally reinterpreted as sequences of simple vowels. These conclusions are similar to those of Lanham (1967).

Again, it is suggested that the consonant system of BSAE shows relatively little phonological divergence from the standard. Bailey, thus largely agrees with Jacobs, but in addition suggests that there is occasional confusion between the approximants /r/ and /l/. This latter feature may be specific to Zulu English (Wade, 1996).

Gough (1996a) notes that the Nguni languages are fairly complex and the only native English phonemes lacking are /ð/ and /θ/. These may be pronounced /d/ and /t/ respectively as suggested by Khumalo (1984), but he suggests that this is typically a basilectal, stigmatised feature. Other more general consonantal features are a generally trilled /r/ sound (as opposed to a liquid). In addition, stops in the Bantu languages also appear to have a later voice onset time in comparison to StdSAE and may also tend to be devoiced in the word final position. This might result in voiced stops being perceived as voiceless.

Wade (1996) analysed various linguistic aspects of BSAE (Zulu English) in attempting to prove that BSAE exists as a variety of English in its own right. Again, he cites vowel length as problematic with /i/ and /I/ both realised as /i/; the distinction between BARED /eə/, BED /e/ and BIRD /ɜ/ is lost as all vowels are realised as /e/; the vowels in BAD /æ/, PART /ɑ/ and PUT /ʊ/ are all realised as /a/; /ɔ/ is used for /ɒ/

(COT) and /o:/ (CAUGHT); /u/ and /ʊ/ are realised as /ʊ/; /ə/ is variably realised as /a/, /i/, /ɛ/ or /u/. Wade (1996) argues that the status of dipthongs is uncertain. He suggests that the broader dipthongs (i.e. those involving relatively large tongue movements) are realised as sequences of the 5 Nguni vowels as follows:

HEIGHT /aɪ/ → /ai/

HOUSE /ɑʊ/ → /au/

COY /ɔɪ/ → /ɔi /

BEARD /ɪə/ → /iɛ / [ie ~ ia]

MOOR /ʊə/ → /ua /

The narrow diphthongs (i.e. those involving relatively small tongue movements) are, according to Wade (1996), replaced by simple vowels in the speech of at least some Zulu English speakers:

i. COAT /oʊ/ → /o·/ resulting in the loss of COAT/COT/CAUGHT distinction.

ii. BADE /eɪ/ → /e· / resulting in the loss of BADE/BED/BIRD/ distinction.

It is suggested that other speakers do not simplify these dipthongs, making use instead of the vowel sequences /oʊ/ and /eɪ/. Wade (1996) further observes that the StdSAE vowel plus /ə/ sequences may be 'split' by some Zulu English speakers and semi-vowels (either /w/ or /j/) inserted between them, as follows:

i. HOUR /aʊə/ → /awa/ POOR /ʊə/ → /uwa/

ii. LOWER /eʊə/ → /owa/ NEAR /ɪə/ → /ija/

Such patterns may reflect the influence of Zulu phonotactics which does not allow the juxtaposition of vowels. Where affixation would result in such juxtaposition of vowel sequences, a process of 'glide formation' applies, eliminating any vowel-vowel sequences, e.g., *esonto+eni* becomes *esontweni* (Buthelezi, 1989).

Table 4 presents a summary of the findings of previous research studies which have focused on BSAE phonology. Table 5 provides a composite list of all features of BSAE phonology which have been described in previous research to date.

Table 4. Summary of studies of BSÀE phonology.

Study	L1 of speakers	Main difficulties: Consonants	Main difficulties: Vowels and dipthongs
Lanham (1963)	Nguni and Sotho		1. Inability to assign length feature to long vowels e.g. /i:/, /ɜ:/, /ɑ:/, /u:/. 2. No mid and high central vowels i.e. /ə/ and /ɜ/. 3. Inability to maintain stress contrasts. Unstressed /ə/ is realised as /ɑ/. 4. Confusion between front vowels /æ/ and /e/.
Lanham and Traill (1965)	Nguni and Sotho		1. BSAE has overly tense basis of articulation. 2. Some dipthongs tend toward monopthongs (e.g. /eɪ/->/e/; /oʊ/ ->/o/) whilst others are extended over two syllables, separated by a glide e.g. /aɪ/->/ajɪ/; /ʊə/->/uwa/.
Lanham (1967)	Nguni and Sotho		/e/, /æ/ and /ɜ/->/e/.
Khumalo (1984)	Zulu	1. /θ/ and /ð/ replaced by /t/ and /d/. 2. /ʒ/ ->/dʒ/. 3. Difficulties with voicing quality of stops.	1. /i/ and /I/->/i/. 2. /æ/, /e/ and /ɜ/->/e/. 3. /ʌ/ and /ə/->/ɑ/. 4. /ɒ/ and /ɔ/->/o/. 5. /u/ and /ʊ/->/u/. 6. Dipthongs are either reduced to single vowels (e.g. /eə/->/e/; /oʊ/->/o/) or are produced as two different vowels separated by a glide e.g./aɪ/ ->/ajɪ/; /ʊə/->/uwa/.
Buthelezi (1989)	Nguni and Sotho	No differences observed.	Difficulties with vowel length and quality.
Jacobs (1994)		1. /θ/ and /ð/ replaced by /t/ and /d/. 2. Devoicing of obstruents /b/, /d/, /g/, /dʒ/ and /z/ word finally. 3. /tʃ/ -> /ʃ/ (occasionally).	
van Rooy (1995)	Tswana (and Afrikaans)	Final devoicing of consonants as part of 'universal trend' in L2 speakers.	
Bowles (1994)	Xhosa		1. /ʌ/ and /ɑ/->/ɑ/. 2. Loss of length contrast results in /i/ and /I/->/i/.
Glaser (1995)	Xhosa and Zulu		/æ/, /e/ and /ɜ/->/e/.
Bailey (in Wade, 1996)	Zulu	May be confusion between approximants /r/ and /l/ (may be specific to L1 Zulu speakers).	1. Inability to maintain stress contrasts. Unstressed /ə/ is variably realised as /ɑ/ or /e/. 2. Inability to maintain length contrasts e.g. /I/->/i/, /o/->/o:/. 3. Dipthongs realised as sequences of simple vowels. 4. /ɜ/->/e/. 5. /ɑ/->/ʌ/. 6. /æ/->/e/ or /ʌ/ (unpredictable).
Gough (1996a)	Nguni and Sotho	1. /θ/ and /ð/ replaced by /t/ and /d/ - thought to be a basilectal feature. 2. Generally trilled /r/. 3. Stops have later voice onset time. 4. Stops may be devoiced in word final position.	1. /ʌ/, /ɑ/->/ʌ/. 2. /æ/, /e/ and /ɜ/->/e/. 3. Length features e.g./o:/, /o/->/o/; /i/, /I/->/i/; /u/, /ʊ/->/u/. 4. /ə/ ->/a/ or /e/. 5. /eɪ/->/e/; /oʊ/->/o/.
Wade (1996)	Zulu	1. /θ/ and /ð/ replaced by /t/ and /d/ very occasionally. 2. Confusion between liquids /r/ and /l/. May be a basilectal feature. 3. Simplification of consonant clusters by insertion of epenthetic vowel e.g. /strɪp/->/sterɪp/. 4. Epenthetic vowel inserted in place of syllabic consonants /n, m, l/ e.g. /botl/->/botel/.	1. Vowel length results in /i/ and /I/->/i/; /ɒ/ and /o:/->/o/; /u/ and /ʊ/->/u/. 2. /eə/, /e/ and /ɜ/->/e/. 3. /æ/, /ɑ/ and /ʊ/->/a/. 4. /ə/->/ɑ/, /i/, /e/ or /u/. 5. Broader dipthongs realised as sequences of 5 Nguni vowels. 6. Narrow dipthongs are replaced by simple vowels or have /w/ or /j/ inserted between them.

Table 5. Composite listing of possible features of BSAE (see references in Table 4.)

Vowels

1. Inability to assign length feature to long vowels so that:
   a) /i/ and /ɪ/ -> /ɪ/ (or alternatively /i/ and /ɪ/ -> /i/)
   b) /u:/ and /ʊ/ -> /u/
   c) /ɒ/, /ɔ/ and /o:/ -> /o/.
2. Absence of mid and high central vowels viz. /ɜ/ and /ə/.
3. Inability to maintain stress contrasts.
   a) Unstressed /ə/ is realised as /ɑ/, or
   b) /ə/ -> /ɑ/, /i/, /e/ or /u/.
4. Confusion between /ɑ/ and /e/.
5. /æ/, /e/ and /ɜ/->/e/.
6. /ʌ/, /ɑ/ and /ə/-> /ɑ/.
7. /eə/ -> /e/.
8. /æ/, /ɑ/ and /ʊ/ -> /a/.
9. An overly tense basis of articulation.

Dipthongs

1. Some dipthongs tend toward monopthongs
   a. /eɪ/ -> /e/
   b. /oʊ/ -> /o/
2. Some dipthongs (the broader ones) are realised as sequences of simple vowels
   a. /aɪ/ -> /ai/
   b. /ɑu/ -> /au/
   c. /ɔɪ/ -> /ɔi /
   d. /ɪə/ -> /iɛ / [ie ~ ia]
   e. /uə/ ->/ua /.
3. Others (the narrow ones) are extended over two syllables and separated by glides
   a. /aɪ/->/ajɪ/
   b. /aʊə/ -> /awa/
   c. /ʊə/ -> /uwa/
   d. /eʊə/ -> /owa/
   e. /ɪə/ -> /ija/.

Consonants

1. Interdental /θ/ and /ð/ are replaced by alveolar /t/ and /d/ (may be a basilectal feature).
2. Devoicing of obstruents /b/, /d/, /g/, /dʒ/ and /z/ - especially in word final position.
3. Devoicing of stops in word final position.
4. May be confusion between approximants /r/ and /l/ (although may be specific to L1 Zulu speakers).
5. /tʃ/ -> /ʃ/ (occasionally).
6. Generally trilled /r/.
7. Stops have later voice onset time.
8. /ʒ/ ->/dʒ/.
9. Simplification of consonant clusters by insertion of epenthetic vowel e.g. /strɪp/->/sterɪp/.
10. Epenthetic vowel inserted in place of syllabic consonants /n, m, l/ e.g. /botl/->/botel/.

Hypotheses based on Flege's Speech Learning Model

According to Flege's Speech Learning Model (1987, 1991 and 1995), sounds in the L2 (in this case StdSAE) that are similar to those in the L1 (in this case Xhosa), are the most problematic to phonologically master. Sounds that are novel (i.e. do not exist in the L1) and sounds that are the same in both languages are thought to be more easily mastered.

In terms of vowels, the first language StdSAE speaker has a greater range of phoneme contrasts at his or her disposal than the L1 Nguni speaker. StdSAE uses a large number of phonetic features to create the phonemic distinctions it contains. A phonetic feature is a phonetic property which can be used to classify sounds e.g. StdSAE makes uses of the phonetic feature length to distinguish between phonemic units. Nguni phonology makes no such length distinctions, and has fewer spatial distinctions. These mismatches could potentially result in underdifferentiation in terms of vowel phonology. Xhosa has a larger number of consonants than StdSAE and it is thus less likely that difficulties will occur – although overdifferentiation may well arise.

The following hypotheses were developed based on Flege's model:

1. StdSAE phonemes which are similar to Xhosa phonemes include /i:/, /ɒ/, /ʊ/, /u:/, /o:/, /ɑ:/ and /h/. It is expected that these sounds will prove maximally problematic for BSAE speakers.
2. Novel sounds include /æ/, /I/, /ʌ/, /ə/ and /ɜ/. All dipthongs (see Table 3) fall into this category. The interdental sounds /ð/ and /θ/ are also novel to BSAE speakers. These sounds are not expected to be problematic.
3. Sounds which are the same include the vowels /e/, /a/, and /ɔ/. The remaining consonants also fall into this category. These sounds are expected to pose little difficulty.

Flege (1987) makes an important distinction between phonetic norms and pronunciation norms. He suggests that while a phonetic norm refers to the physical measurement of specific aspects of sound production (e.g. voice onset time), a pronunciation norm refers to the collective judgement of native speakers concerning how a sound ought to be produced. A substantial number of researchers have focussed on phonetic and acoustic

parameters of foreign accents (e.g. see Wayland, 1997 for a review). However, such studies are limited – at least to speech and language therapists - in that they do not reveal which characteristics of the non-native production cause native listeners to hear them as being foreign-accented. Furthermore, they give no indication of the effect of the non-native pronunciation on communicative success.

Baetens-Beardsmore (1986) is one of the applied researchers who places great emphasis on the effects of interference rather than interference per se. He notes that the effects of phonological interference on intelligibility can vary depending on the type of interference that occurs: phone substitution is thought to be striking but affects intelligibility only minimally; re-interpretation also poses few problems; overdifferentiation will hardly be noticed by the monolingual listener whereas underdifferentiation constitutes what is "probably the most common form of interference..." (p. 73) and often leads to misinterpretation on the part of the listener. Stobbart (1992) and Grosjean and Soares (1986) similarly emphasise outcomes in communication and caution that "if bilinguals must be compared to monolinguals, it should be at the level of communicative competence. The question that should be asked is: Can bilinguals, by means of one language, the other language, or the two languages together, communicate as efficiently as monolinguals?" (Grosjean and Soares, 1986 p.179).

An emerging area of interest in the profession of speech and language pathology is the communication instruction of individuals desiring to improve their use of Standard English grammar, vocabulary and phonology (Asha, 1983). Speech and language therapists have the potential to involve themselves with clients who use a non-standard dialect and what is commonly called an 'accent.' Certainly, speech and language therapists in South Africa have become increasingly sensitive to their bilingual clients' needs and it is a commonly held view that this knowledge and awareness is required so that they are able to distinguish between pathological articulation errors and those that result from first language interference (Penn, 1978; Proctor, 1994; Glaser, 1995). This remains a relevant aspect of clinical work in any multilingual context. However, in this paper I suggest that speech and language therapists are ideally positioned to involve themselves one step further in serving the needs of non-standard English speakers in a

context that is removed from the pathological, but remains concerned with successful communication in a broader sense.

In South Africa there is some confusion regarding the involvement of speech and language therapists with such client groups, and an uncertainty about the appropriacy of speech and language involvement in the domain. The American Speech-Language-Hearing Association (ASHA) has developed guidelines for working with individuals who want to acquire standard English. These guidelines state that the speech-language pathologist may "provide elective clinical services to nonstandard English speakers who do not present disorder" (p.24). However such services should be delivered in such a way as to provide the desired competency in Standard English without jeopardising the integrity of the individual's first language or other dialects. Britain's Royal College of Speech and Language Therapists (RCSLT) espouses a similar point of view, suggesting that speech and language therapists should strive to maximise communication in all client groups whilst regarding bi- and multilingualism as an asset (See RCSLT's Communicating Quality, 1996). The present research aligns itself with these professional views and suggests that there is a need to promote this type of speech and language therapy service in multilingual South Africa where L2 speakers abound and have specific needs and aspirations in terms of English proficiency.

The study aims not to be prescriptive in focus, but rather takes cognisance of the fact that there is a universal trend for individuals to favour standard productions, and of the belief that speakers of non-standard varieties of English have a right to acquire more standard features should they desire to do so. Differences in dialect, language and culture act as 'levels of remove' (Cameron and Williams, 1997) and may combine today with the effects of the country's apartheid history to result in misunderstanding and sometimes fractured relations between different cultural groups. From a pragmatic perspective, interference has the potential to reduce intelligibility (Jacobs, 1984) and thereby result in miscommunication, and this is the domain of the speech and language therapist. Therapists who involve themselves in the area may be uncertain as to how specifically to address the needs of BSAE speakers. Once therapists have agreed that it is appropriate and desirable to get involved with issues related to the accents of BSAE clients, the next question may well be: *how* do we get involved?

This paper argues that speech differences should be divided into those which characterise the accent and do not compromise intelligibility, and those features which lead to miscommunication. Therapists need to be clear about the rationale for therapy and their ultimate goal since phonological intervention with dialectal speakers may address one or both of the following levels:

1) *Level 1 - Functional Level*: Phonological intervention may be aimed at addressing purely functional difficulty i.e. The client is unable to adequately convey meaning because realisations of some phonemes differ too widely from the standard production. Intervention addresses those differences that lead to miscommunication, so that the individual is able to make him/herself correctly understood when functioning in a StdSAE environment.
2) *Level 2 - Aesthetic Level*: At a more advanced level, there may be clients who desire to master or more closely approximate the standard dialect of a language. Their speech is adequate in terms of conveying a message, but for aesthetic and/or utilitarian reasons they aim for a reduced BSAE accent.

When addressing the functional level, understanding of the features that are most likely to lead to miscommunication in situations calling for standard dialect usage, would be valuable. Vowel distortion has most often been cited as the cause of miscommunication for BSAE speakers, however Jacobs (1994) claims that the cumulative effect of consonantal features in BSAE is a fairly drastic decrease in intelligibility. Homophones create ambiguity which contextual linguistic cues may not resolve.

This paper examines interference in BSAE in terms of the predictions made by Flege's Speech Learning Model and in the light of previous research in the field. Researchers have approached the subject from widely different subject areas, ideological views and methodologies over the course of some 40 years – and these papers have often been of limited practical value to the speech and language clinician. Speech and language therapists need to possess a clear understanding of the prominent features that characterise BSAE phonology, as well as the system and structure of the bilingual's two distinct phonological systems. Only once normative information has been acquired can adequate linguistic analysis and principled therapeutic intervention take place at one or both of the levels mentioned.

The present study aimed to focus specifically at a performance level, and to determine trends in the patterns of failure and success in BSAE subjects' communication of single word items to StdSAE listeners. These segmental features were then related to the functional and aesthetic levels which, it is suggested, will have particular relevance to speech and language therapists.

METHODOLOGY

Aims

The main aim of the present study was to determine the nature of the listener confusion which occurs when BSAE speakers communicate a list of common single words to StdSAE speakers, in a 'live' situation. More specifically, the aims of the study were:

1. To describe patterns of success and failure in the oral communication of single word items by BSAE speakers to StdSAE partners.
2. To pinpoint the specific difficulties at a segmental level which result in either failure or success.
3. To re-examine previous research in the field, together with the trends found in the present study, and to classify BSAE features into those that affect functionality of communication, and those that differ only at an aesthetic level.
4. To evaluate the application of Flege's Speech Learning Model to BSAE speakers, and its clinical applicability for speech and language therapists.

Design of the Study

A multiple single-case design was employed, with a qualitative investigation of each dyad's communication, as the main focus. The single-case methodology gives the means to systematically describe individual differences and also patterns of commonality within the group.

Subjects

A total of 22 volunteer subjects were used and consisted of a BSAE (speaker) group of 10 subjects and a StdSAE (listener) group of 12 subjects[7]. Ten dyads were used, each pair consisting of one BSAE and Xhosa first language speaker, and one first language StdSAE speaker. Members of each pair were matched in terms of gender and age. Trudgill (1983) has described differences between male and female speech, particularly

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[7] Each BSAE speaker was paired with two StdSAE individuals who met criteria for age and gender matching. Because dyads were restricted to one gender and an odd number of male and female dyads were used, four StdSAE subjects were exposed to only one BSAE reader and listened to only one half of the total wordlist. This accounts for the fact that 12 StdSAE subjects as opposed to 10 BSAE subjects were used in the study. Such aspects are further elucidated in the section on experimental procedure which follows.

with regard to accent and the perception thereof. Both male and female speakers and listeners were used in the study to yield a variety of results. However, following Shrearer (1982) dyads were restricted to one gender. Seven female dyads and three male dyads participated in the study. The criterion for age matching was that individuals differed by no more than 10 years in age. The study aimed to focus on BSAE and StdSAE subjects who are middle class, economically-productive members of society. Subjects either worked at Groote Schuur Hospital in Cape Town, or were attending outpatient clinics at the hospital. Subjects were selected for ease of accessibility.

Selection criteria applicable to both groups:

1. *Learning ability*: That subjects had normal learning ability and exposure to at least a Std 8 level of education. Learning ability was not formally assessed but it was felt that any difficulties would be noted in the literacy evaluation and interview.
2. *Hearing:* That subjects had normal hearing and were able to pass a pure tone audiometric screening evaluation. Subjects were assessed using a portable Belltone Audiometer in a quiet room. All subjects were required to have normal hearing thresholds bilaterally which fell at or below 20 dB HL at 250 Hz, 500 Hz, 1000 Hz, 2000Hz and 4000Hz.
3. *Age:* That subjects were no younger than 20 years of age and no older than 55 years of age. The mean age of subjects in both groups was 38 years. The cut off points were suggested since beyond 55 years of age, hearing and cognitive abilities may decrease, and individuals younger than 20 years of age will have only limited English exposure in a tertiary education environment or workplace. The age range was deliberately broad in order that a variety of BSAE speech could be examined.

Selection criteria specific to BSAE subjects:

1. Subjects were required to have a Nguni language as their first language. Xhosa is the predominant Nguni language in the Western Cape. Since data collection was restricted to this area, all subjects were Xhosa L1 speakers. Wade (1996) argues convincingly for the generalisability of his Zulu English data to all BSAE speakers: The Nguni languages predominate in the country and are "to a considerable extent mutually intelligible." (p.2). Similar arguments apply to this study of Xhosa English.

2. Subjects were required to have English as a second language.
3. Subjects were required to have been exposed to English for at least 10 years in a work or study environment in the Western Cape and to use English in their daily work or study environment. The intention in devising these criteria was to investigate the BSAE of an emerging black middle class who are most likely to form the bulk of speech and language therapy clientele in South Africa in the future.
4. As the experimental task involved reading a list of words, subjects were required to be able to read fluently in English. Reading ability was assessed using the 'grandfather' passage (Shipley and McAfee, 1992 p.121), and a judgement was made by a speech and language therapist as to whether a reasonable standard of fluency was met.

Selection criteria specific to StdSAE subjects:

1. Subjects were required to have a dialect approximating respectable StdSAE as their first language, and to have been educated in an English medium school.
2. Subjects were required to use StdSAE in their daily work or study environment.
3. Subjects were excluded from the study if they were able to speak one of the Nguni languages, since this might have affected their perception of BSAE speech.
4. As the experimental task required StdSAE listeners to write down the words perceived, subjects were required to have the ability to write. Writing was assessed by means of a dictation exercise using selected lines from the 'grandfather' passage, and a judgement was then made by a speech and language therapist as to whether writing skill was acceptable.

Degree of bilingualism

Degree of bilingualism is notoriously difficult to estimate (Baetens-Beardsmore, 1986; Saunders, 1988). A questionnaire (see Appendix 1) was orally administered to determine each individual's history of language exposure and usage, as part of the subject selection procedure. The relevant biographical information pertaining to each BSAE subject is presented in Table 6. Profiles of language use and language exposure for the BSAE subjects are presented in Tables 7 and 8 respectively. BSAE subjects were arbitrarily assigned a subject number and are referred to as S1-S10 in tables and text

throughout the paper. Biographical and sociolinguistic information pertaining to StdSAE subjects is presented in Appendix 2. Table 7 reveals that all BSAE subjects, with the exception of one (S2)[8], were able to speak some Afrikaans as a third language. Similarly, all StdSAE subjects were L2 speakers of Afrikaans, so that Afrikaans was at least a confounding linguistic variable for both groups. Tables 6-8 (and to a lesser extent Appendix 2) indicate the extent of multilingualism in South Africa. It is interesting to note that 8/10 BSAE subjects reported English as their 'preferred' language whilst all subjects had Xhosa as their L1 and the language most used at home.

Table 6. Biographical information relevant to each BSAE subject.

Subj.	Age	Sex	Occupation	Duration	Place of Birth
S1	21	F	Medical Technology Student	Final year student	Umtata,Transkei
S2	30	F	Supermarket Cashier	6 years	Cape Town
S3	49	M	Butler	25 years	Butterworth, Transkei
S4	35	M	Hospital receptionist	10 years	Cape Town
S5	26	F	Nurse	3.5 years post-qualification	Sterkspruit, Eastern Cape
S6	34	F	Nurse	9 years post-qualification	Alice, Eastern Cape
S7	47	M	Supervisor in fishing company	8 years	Somerset East, Eastern Cape
S8	48	F	Hospital housekeeper	14 years	Cape Town
S9	34	F	Nurse	10 years post-qualification	Umtata, Transkei
S10	42	F	Cook	12 years	Cape Town

[8] Without exception, all BSAE subjects had a strong negative attitude towards Afrikaans. In South Africa, Afrikaans was the language associated with the Apartheid Government, and its use as a medium for education in black South African schools under the Apartheid Government was a source of great resentment (Hartshorne, 1987). S2 *may* thus have more knowledge of Afrikaans than she cared to admit.

Table 7. Patterns of language exposure relevant to each BSAE subject.

Subj.	L1	L2	Other	Mother's L1	Father's L1	Mother's L2	Father's L2	Other language at home	Medium at school
S1	Xhosa	English	Afrikaans, Zulu	Xhosa	Xhosa	English	English	Zulu	English
S2	Xhosa	English	Nil	Xhosa	n/a	English	n/a	Nil	Mainly Xhosa, some English
S3	Xhosa	English	Afrikaans, Zulu	Xhosa	Xhosa	English	Nil	Nil	Mainly Xhosa, some English and Afrikaans
S4	Xhosa	English	Afrikaans, Zulu	Xhosa	Xhosa	English	English	Nil	English, Afrikaans, Xhosa
S5	Xhosa	English	Sesotho, Afrikaans	n/a	Xhosa	n/a	Sotho	English	Xhosa and English
S6	Xhosa	English	Afrikaans	Xhosa	Xhosa	Nil	Nil	Nil	Xhosa, English and Afrikaans
S7	Xhosa	English	Afrikaans	Xhosa	Xhosa	Afrikaans	Afrikaans	Nil	Xhosa, English and Afrikaans
S8	Xhosa	English	Afrikaans, Sesotho	Xhosa	Xhosa	English	English	Sotho	Afrikaans, English and Xhosa
S9	Xhosa	English	Afrikaans	Xhosa	Xhosa	English	English	Sotho	Xhosa predominantly
S10	Xhosa	English	Afrikaans	Xhosa	Xhosa	English	English	Nil	English, Xhosa, Afrikaans

Table 8. Patterns of language use relevant to each BSAE subject.

Subj.	Language(s) used at home	Language(s) for socialising	Preferred language	Language(s) in the workplace
S1	Xhosa	Xhosa and English	English	English
S2	Mainly Xhosa, some English	Xhosa and English	English	English
S3	Xhosa	Xhosa	English	English, Xhosa and Zulu
S4	Xhosa and English	Xhosa and English	English	English with colleagues; English or Xhosa with visitors
S5	Xhosa and English	Xhosa	English	English with colleagues; English or Afrikaans or Xhosa with patients
S6	Mainly Xhosa, some English	Xhosa and English	Xhosa	English with colleagues; English or Xhosa with patients
S7	Xhosa	Xhosa	English	Xhosa and English
S8	Mainly Xhosa, some English	English	English	English and Afrikaans; Occasional Xhosa translation
S9	Xhosa	Xhosa	Xhosa	English
S10	Xhosa	Xhosa	English	English and Afrikaans

Stimuli

A list of stimulus words (see Appendix 3) was constructed to allow for the production of each StdSAE vowel, dipthong and consonant in a variety of contexts. Each phoneme was targeted in at least two different words. Ideally, phonemes should be targeted in all possible word positions and with a variety of syllable structures, but practical constraints in terms of the length of the list and learner effects were important considerations that led to this compromise. The final master list consisted of 120 commonly-used English words of which approximately two thirds were repeated items (72 items plus 48 repeated items). Items which appeared twice were used to yield measures of intrasubject reliability. All words were monosyllabic words with either open or closed syllable structure, with the exception of two bisyllabic words which gave the opportunity to produce the unstressed /ə/ phoneme. Monosyllabic words potentially allow for the production of many homophones. Ten unique lists numbered A-J were then created from the master list. Each list had a different randomised order, and these were generated by using a random numbers table. Each list was structured into 12 groups of 10 words each.

Single words have communicative relevance and StdSAE listeners were expected to be guided by semantic constraints as they would in a natural communicative setting. Situational and syntactic cues were, however, lacking, and this made the experimental task unnatural and more difficult than in a 'real-life' setting. On the one hand, this can be regarded as a methodological shortcoming of the study. On the other hand it might offer the speech and language therapist a practical and reasonably constrained way in which to assess BSAE phonology, as most developmental phonology assessments use a single word format.

Preliminary Investigation

A pilot investigation was carried out to determine whether the list of stimulus words achieved a moderate level of difficulty, and whether any other difficulties in the procedure (described in the following section) were apparent. Two dyads, consisting of a total of 4 (2 BSAE and 2 StdSAE) volunteer female subjects who met all subject selection criteria, were used. A moderate level of difficulty was found: the StdSAE listeners correctly perceived 62% and 64% of the words, and the word list was therefore

not modified further. The wording of some question items in the subject selection questionnaire was refined to reveal more specific information.

Procedure

Place and duration of data collection

The experimental exchange took place in a quiet office in a hospital clinic, where reader, writer and researcher were present. Data collection took place over the course of one full weekday.

Formation of dyads and swapping of listeners

Each BSAE subject was paired with two StdSAE individuals who met criteria for age and gender matching. Because the investigation involved a 'live' exchange between 2 individuals either working in the hospital or attending clinics, formation of dyads was to some extent determined by convenience (e.g. depending on timing of individuals' tea-breaks or appointments).

Complete word lists were divided into two smaller sub-lists of 60 words each. Each BSAE subject read a full word-list (120 words), with one half presented to one StdSAE subject (60 words) and the other half to another StdSAE subject (60 words). The purpose of having two StdSAE listeners was to counter any learning effects which might occur when listening to a fairly lengthy sample of speech from one individual. At the end of the first 60 word presentation, the first StdSAE subject was asked to leave the room and the second StdSAE subject was presented with the remaining half of the word list. Most of the StdSAE subjects were exposed to two different BSAE readers, so that each StdSAE subject listened to 120 items spoken by two different BSAE readers, and each BSAE reader read a complete word list to two different StdSAE listeners.

Because dyads were restricted to one gender and an odd number of male and female dyads were used, 4 StdSAE subjects were exposed to only one BSAE reader and listened to only one half of the total wordlist. This accounts for the fact that 12 StdSAE subjects as opposed to 10 BSAE subjects were used in the study.

Instructions to listeners

Each StdSAE subject was advised that s/he would be taking the role of 'writer' in the experimental situation, whilst the BSAE subject would be the reader. It was explained that the BSAE subject would be reading a list of common English words and that they needed to listen carefully and write down the words which they heard on the blank answer sheets provided. Each answer sheet was numbered A-J depending on the corresponding list to be read. Subjects were advised that many words would be repeated throughout the list. They were requested to guess a word if they were uncertain of what to write (see Appendix 4 for instructions given to subjects).

Instructions to readers

Each BSAE subject was presented with a copy of a randomly selected stimulus list. Each list was divided into two parts, and the BSAE reader was required to read the first part of the list (60 single words) to the first StdSAE listener.

The word list had English words grouped into clusters of 10 words and readers were asked to read each word followed by a pause so that there was sufficient time for the listener to write down the response. Between sections of 10, it was requested that a longer pause should be left which would enable the writer to determine if either writer or speaker had erroneously omitted any items.

The speaker was requested to read each word only once, and to leave an adequate pause following presentation of an item which would allow the listener time to write down what was heard. In doing this, it was assumed that the BSAE reader carried out a grapheme-phoneme conversion which reflected the nature of his/her phonological system which might reveal some inadequacies due to linguistic interference. The listener wrote down what was heard based on his/her own phoneme-grapheme conversion. This reflected the speaker's inadequacies as well as any perceptual inadequacies of the listener. Presuming that the listener performed the conversion in his/her own first language, the latter factors should have been minimal whilst former factors should have been clearly reflected. A final grapheme-phoneme analysis was then performed by the researcher to ascertain the nature of the communicative inadequacies.

Analyses

Intra-subject reliability is discussed first in this section, followed by a description of the analysis of the written data of StdSAE subjects to determine patterns of success and failure in the communication of single word items by BSAE speakers to their partners, and a more detailed analysis of these trends at a segmental level. The final section describes the nature of the evaluation in terms of previous research and Flege's Speech Learning Model.

Intra-subject reliability

A proportion of the words on each word list (66.6%) were repeated to yield measures of intra-subject reliability. A master list of 120 words was subdivided into two lists of 60 words each. One BSAE reader was required to present the two half lists to two different StdSAE subjects. The lists were constructed in such a way that each 60 word list was constituted of two thirds repeated words, and thus two different types of reliability, listener reliability and speaker reliability, could be described:

a) Listener reliability - how consistently did each individual StdSAE listener respond to the same speaker?

   Frequency counts of agreement of word identification responses were made for each StdSAE subject and expressed as a percentage of agreement i.e. 100% agreement occurs when responses for all repeated items are consistently in agreement. These results are presented in Table 9a below, and range from 70.8% (StdSAE subject 12) to 95.8% (subject 5), with a mean of 82.95%. Results suggest an acceptable level of intra-subject reliability, but with the exception of subjects 4 and 5, fail to meet Shrearer's (1982) 90% criterion for good reliability. Results should thus be viewed with some caution.

Table 9a. Percentages of intra-subject reliability for StdSAE listeners.

StdSAE Subject	1	2	3	4	5	6	7	8	9	10	11	12	Mean
% of agreement for repeated items	75	83.3	83.3	91.6	95.8	87.5	83.3	83.3	87.5	75	79.1	70.8	82.95

b) Speaker reliability – how consistently were each BSAE speaker's words perceived by two different listeners?

Results for the two StdSAE listeners who listened to one BSAE speaker, were pooled to yield an overall measure of reliability for a particular BSAE subject. Frequency counts of agreement of word identification responses were made for each of the BSAE readers and expressed as a percentage of agreement i.e. 100% agreement occurs when responses for all repeated items are consistently in agreement. These results are presented in Table 9b below, and range from 70.83% (S10) to 87.5% (S3), with a mean of 81.03%. Results suggest an acceptable level of intra-subject reliability, but again fail to meet Shrearer's (1982) 90% criterion for good reliability, and should be viewed with some caution. The levels of reliability may also suggest that subjects found the task confusing, and when uncertain about the correct response, attempted with varying degrees of success, to guess what BSAE speakers might have read, based on their knowledge and previous experiences with BSAE.

Table 9b. Percentages of intra-subject reliability for BSAE readers.

BSAE Subject	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	Mean
% of agreement for repeated items	81.25	83.33	87.5	85.4	81.25	81.25	85.4	77.08	77.08	70.83	81.03

Analysis of the written data of StdSAE subjects to determine patterns of success and failure

The answer sheets of StdSAE subjects were examined in terms of the master lists which had been read by BSAE subjects. Each written 'answer' word was marked as either correct when it matched the item which the BSAE speaker had read, or it was marked incorrect when it differed. Spelling was not considered important, provided the written word shared pronunciation with the target (e.g. The written word 'cede' was considered correct for the target 'seed.') The resulting percentages were interpreted as an overall measure of success that was achieved in the experimental task. Quantitative measurement of success was not a goal of the study since the list was specifically designed to have a moderate level of difficulty for BSAE speakers, and there was no

control group of StdSAE readers against which to compare BSAE speakers. The qualitative examination of errors was a more central concern.

Each incorrect word was examined to determine where the difficulty seemed to have occurred. It was expected that in some cases incorrect vowel perception resulted in inaccurate answers (e.g. 'bed' for 'bird'), in other cases incorrect consonant perception (e.g. 'bet' for 'bed') and in other cases combinations of both vowel and consonant errors (e.g. 'sit' for 'seed'). Errors were analysed into vowel and dipthong errors, and consonant errors and expressed as a percentage of the total vowels and consonants in the list to determine if any broad trends in errors could be evidenced.

Detailed analysis of the trends at a segmental level

This section provides a detailed description of the error analysis, firstly of vowels and dipthongs, and then followed by an analysis of consonants, which broadly follows the same format. In the section on vowels and dipthongs, these phonemes were examined in categories of front, central and back vowels, and dipthongs. Clinical analyses by Stoel-Gammon and Herrington (1990) and Pollock and Keiser (1990) of vowel errors in children were used as a basis for the analysis.

Clinical evaluations of phonology typically have their focus predominantly on consonants since these sounds prove developmentally more difficult than vowels. Developmental phonological assessments most commonly rely on distinctive feature analysis and analysis of phonological rules (Lowe, 1994) and this type of analysis is familiar to most speech and language therapists. Detailed analysis of vowel errors is less commonly carried out by speech and language therapists, and considerably less attention has been given to vowel and dipthong error analysis in speech and language therapy literature (Pollock and Keiser, 1990; Stoel-Gammon and Herrington, 1990). The clinical analysis of Stoel-Gammon and Herrington (1990) was used in the present study because it provides a comprehensive analysis of vowel and dipthong errors within a readily applicable framework.

The error analysis of consonants relied on frameworks of distinctive feature analysis (Chomsky and Halle, 1968) and phonological process analysis (Ingram, 1981; Grunwell, 1982). In addition, Stoel-Gammon and Herrington's (1990) vowel analysis framework was further adapted for use in the consonant section of the paper, where it

was used to summarise relevant information derived from the distinctive features and phonological process analyses.

Stoel-Gammon and Herrington's (1990) framework involves the development of individual subject profiles to describe phoneme usage. Individual subject profiles for vowel and consonant systems of each of the BSAE speakers were reconstructed based on the written data of their listeners. These profiles qualitatively described accuracy rates for individual sounds and favoured substitution patterns. Where a phoneme was correctly perceived for more than 75% of instances of use, it was considered correct. Where a phoneme was correctly perceived for less than 75% of instances of use, it was considered incorrect (following Pollock and Keiser, 1990). Accuracy rates were further described within each of these two categories depending on the frequency of success with which phonemes were perceived,

i.e. *Correctly:* (1) always correctly (100%), (2) mostly successfully (75%+);
In Error: (3) with occasional success (less than 75% correct), and (4) never correctly (0%).

The errors were further analysed in terms of favoured substitute. The favoured substitute refers to the substitute phoneme(s) most frequently perceived in place of a particular target sound.

Information presented in the individual subject profiles was then analysed to determine trends which recurred from subject to subject, and idiosyncratic differences which occurred in isolated instances or for only subject. The individual subject profiles were followed by tables which indicated the percentage of correct usage for each individual phoneme across subjects, as well as the phonemes more consistently in error. Error matrices for vowels and consonants were presented together with a summary of the findings of the error analysis.

Evaluation of Results

The main findings of the study were contrasted with those of previous researchers. It was hypothesised that by 'subtracting' the findings which were found to compromise intelligibility in the present study, from a full range of previously listed BSAE features, 'aesthetic' features which did not compromise intelligibility would remain. BSAE features would thus be divided into two categories: those characteristic of the functional level

and those at a more aesthetic level. Hypotheses stated with regard to Flege's Speech Learning Model were also examined.

RESULTS & DISCUSSION

Results of the investigation are presented in the following sequence. The first section gives an overview of trends in the data, by describing quantitative measures of success at the whole-word level and within broad phoneme categories (i.e. vowels and dipthongs, and consonants). The second section concerns itself with phonemes at a segmental level. Errors found in the written data of subjects are used as pointers to underlying perceptual or pronunciation difficulties. These errors are detailed and discussed, firstly in terms of vowels and dipthongs followed by a discussion of consonants. In the final section, results are evaluated in terms of the specific aims of the study.

Analysis of StdSAE subjects' responses to determine patterns of success and failure

Percentage of words correct

Each BSAE subject read one half of the wordlist to one listener, and the remaining half to another listener in order to counter learning effects. The overall percentage of words correctly perceived was calculated for each BSAE reader. The results are presented in Table 10. Percentages ranged from 46.6% to 81.6%. The total percentage of correct words for each BSAE subject is presented in the final column, and these scores fell between 55% and 71%.

Overall it can be seen that the subjects communicated approximately one half to two thirds of their message accurately to their listeners.

Table 10. Overall percentage of words correctly perceived.

Subject	Listener 1 % Correct Words	Listener 2 % Correct Words	Total % Correct Words
S1	58.3	76.6	67.5
S2	71.6	48.3	60
S3	68.3	73.3	71
S4	58.3	81.6	70
S5	63.3	76.6	70
S6	53.3	56.6	55
S7	58.3	73.3	66
S8	63.3	46.6	55
S9	71.6	51.6	61.5
S10	63.3	68.3	66
Mean	*62.96*	*65.28*	*64.2*

Percentage of phonemes correct

The overall percentages of vowels/dipthongs and consonants correctly perceived are presented in Table 11.

Table 11. Percentages of individual phonemes correctly perceived.

Subject	% Consonants Correct	% Vowels / dipthongs Correct
S1	92.1	75.4
S2	88.1	68.5
S3	97.4	79.6
S4	95.5	81.7
S5	94.3	74.4
S6	86.3	77.2
S7	90.0	78.4
S8	92.0	72.0
S9	90.5	70.4
S10	87.2	82.4
Mean	*91.3*	*76.0*

Consonant scores were consistently higher than those of the vowels and dipthongs, suggesting that it is vowel and dipthong errors which are mostly, although not entirely, responsible for compromised intelligibility. Even the 'worst' subject's consonants were perceived accurately more than 86% of the time. Only two subjects (S4 and S10) had

their vowels and dipthongs accurately perceived more than 80% of the time. The majority of subjects' (7/10) vowels and dipthongs were accurately perceived 70 to 79% of the time. One subject (S2) had a score that fell marginally below this range (68%).

Vowels and dipthongs, and consonants are discussed separately in the following sections.

Detailed analysis of the trends at segmental level

Vowels and dipthongs

Individual subject profiles which detail accuracy rates for vowels and dipthongs, and major error patterns for BSAE subjects (S1-S10) are presented in Table 12. Table 13 presents the percentage of correct perceptions for each vowel for each BSAE subject. As shown in the first table, the majority of subjects (9/10) had evidence of all StdSAE vowels and dipthongs in their phonological systems. Only S9 showed no evidence of the front vowel /æ/. Several subjects (S1, S2, S5, S8) had this phoneme perceived with low rates of accuracy, but had the phoneme perceived as a primary substitute for *other* sounds i.e. /æ/ was used, albeit incorrectly. S9 showed no evidence of /æ/ usage, and the phoneme may be lacking from the subject's phonological inventory. This is not altogether surprising given that the Xhosa vowel system does not have the phoneme /æ/. Primary substitutes for this phoneme are discussed in some detail in the following section.

In this study, scores of less than 75% were regarded as phoneme errors (Pollock and Keiser, 1990). A distinction was made between sounds never perceived correctly (0%) and phonemes perceived with occasional success (scores between 0 and 75%). In terms of correct phonemes, a distinction was made between sounds that were always correctly perceived (100% accuracy) and phonemes that were mostly correct (from 76% to 99%). Using this categorisation, it can be seen in Table 12 that one subject (S1) had 10 vowels in error; two subjects (S2 and S8) had 9 vowels in error; three subjects (S5, S6 and S9) had 8 vowels in error; one subject (S4) had 7 vowels in error; two subjects (S3 and S7) each had 6 vowels in error, and the remaining subject (S10) had 5 erroneously perceived vowels.

A comparison of subjects' error profiles reveals that the vowels most consistently in error were /i/ and /ɜ/ (incorrect for all subjects); /æ/ (incorrect for 9/10 subjects) and /e/, /ɑ/, /ʌ/, /o:/ and /eə/ (incorrect for 6 or more subjects). The vowels and dipthongs perceived correctly most often were /eɪ/, /ə/, /o/, /ʊ/, /u/, /aɪ/, /ɑʊ/, /oɪ/ and /ɪə/.

In terms of accuracy levels and favoured substitutes, certain trends are evident. These are discussed in sections based on the Respectable SAE vowel quadrilateral (see Table 2, p.14) moving from front to back.

Front vowels

1. The high, long /i:/ and the more central /I/ were used in an underdifferentiated way by the majority of subjects (8/10), e.g. itch for each; sleep for slip. Xhosa does not use length phonemically (Lanham, 1963) and thus the Nguni subjects appeared to find it difficult to differentiate between these two sounds which are distinguished mainly by length. Accuracy for the short /I/ was better than that for long /i:/. 7/10 subjects had /I/ successfully perceived most of the time[9]; two subjects had it successfully perceived at all times and one subject used it successfully only occasionally[10]. /i:/ fell into the 'occasional success' category for all subjects.
2. S9 and S10 had /e/ successfully perceived for most of the time. All other subjects had /e/ falling in the 'occasional success' category. This vowel features in Nguni phonology, but again it is underdifferentiated from the other StdSAE front vowels. Primary substitutes were the front /æ/ (e.g. bad for bed; as had been suggested by Lanham, 1963) and the central /ɜ/ (bird for bed). S2 had unusual substitutes, such as the long back /ʊ/ (e.g. good for get) and /eɪ/ (e.g. wait for wed). These are most likely idiosyncratic patterns – although the 'choice' of the front dipthong /eɪ/ is understandable as a replacement for the front vowel.

[9] 75% or more instances of use with success
[10] 75% or fewer instances of success

Table 12. Individual subject profiles: vowels and dipthongs

Subject	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10
Accuracy Rates										
Always successful	/ə/; /ɒ/ /ʊ/; /u/ /eɪ/; /aɪ/ /ɑʊ/; /ɪə/ /ɛə/	/ə/; /ɒ/ /ʊ/; /u/ /eɪ/; /aɪ/ /ɑʊ/; /oʊ/ /ɔɪ/	/ə/; /ɒ/ /ʊ/; /u/ /eɪ/; /aɪ/ /ɑʊ/; /ɪə/ /ɔɪ/; /ʊə/ /o:/	/ə/; /ɒ/ /ʊ/; /u/ /ɑ/; /eɪ/ /ɑʊ/; /ɪə/ /oʊ/; /o:/ /ɔɪ/; /aɪ/	/ə/; /ʊ/ /u/; /ɑ/ eɪ/; /aɪ/ /ɑʊ/; /ɪə/ /ɔɪ/	/ə/; /ɔ/ /ʊ/; /ʌ/ eɪ/; /aɪ/ /ɑʊ/; /ɪə/ /ɔɪ/; /ʊə/	/ə/; /æ/ /ʊ/; /u/ /ʌ/; /eɪ/; /aɪ/ /ɔɪ/; /ɪə/ /ʊə/; /ɛə/	/ə/; /ɒ/ /ʊ/; /u/ /ɑʊ/; /aɪ/ /ɔɪ/; /ɛə/ /ʊə/; /ɪə/	/ə/; /ɒ/ /ʊ/; /u/; /ɪ/ /aɪ/; /ɑʊ/ /ɔɪ/; /ɪə/ /ʊə/	/ə/ /ʊ/;/u/ /ɪ/; /aɪ/ /ɔɪ/;/ɪə/ /ʊə; /oʊ/ /ɑʊ/; /ɛə/
Mostly[1] *successful*	/oʊ/	/ɪ/;/e/	/ɪ/; /e/; /oʊ/	/ɪ/	/ɪ/; /ɒ/; /oʊ/	/ɪ/; /ɒ/	/ɪ/; /ɒ/; /ɑʊ/	/ɪ/; /eɪ/	/e/	/e/; /ɑ/ /eɪ/; /o:/
Occasionally[2] *successful*	/i/; /ɪ/; /ɜ/ /e/;/ʌ/; /ɑ/ /o:/; /ɔɪ/ /ʊə/	/i/; /ɜ/; /ɑ/ /ʊə/; /ɪə/ /o:/; /ɛə/	/i/; /ɜ/; /ʌ/ /ɑ/; /æ/ /ɛə/	/i/; /e/; /ʌ/ /ɜ/; /æ/; /ʊə/ /ɛə/	/i/; /e/; /ʌ/ /ɜ/; /ʊə/ /o:/; /ɛə/	/i/; /e/; /ɜ/ /æ/; /ɑ/; /oʊ/ /o:/; /ɛə/	/i/; /e/; /ɑ/ /oʊ/ /oʊ/; /ɛə/; /o:/	/i/; /e/; /ʌ/ /ɜ/; /ɑ/ /oʊ/; /o:/	/i/; /ɜ/; /ʌ/ /ɑ/; /eɪ/ /ʌ/	/i/; /ɜ/ /ɒ/; /æ/
Never successful	/æ/	/æ/; /ʌ/	nil	nil	/æ/	nil	/ɜ/	/æ/	/æ/	nil
Primary substitutes										
Target										
i	*I*	*I*	*I*	*I*	*I*	*I*	*I*	*I*	*I*	*I*
I	*i*	*i*	*i*	*i*	*i*	*i*	*i*	*i*	-	-
e	*æ*	*u/eɪ*	*æ*	*æ*	*ɜ*	*æ*	*æ*	*ɜ*	*ɜ*	*ɜ/ʌ*
eɪ	-	-	-	-	-	-	-	*i*	*i*	*aɪ*
æ	*e*	*e/I*	*e*	*e*	*I*	*I*	-	*I*	*I*	*ɜ*
ʌ	*ɑ*	*æ*	*ɑ*	*ɑ*	*ɑ/æ*	-	-	*ɑ*	*ɑ*	*ɒ*
ɒ	-	-	-	-	*oʊ*	*oʊ*	*o:*	-	-	*oʊ*
ɑ	*ʌ*	*ɒ/æ*	*ɒ*	-	-	*ʌ*	*ʌ*	*ʌ*	*ʌ*	*e*
ɜ	*æ*	*e*	*æ*	*æ*	*e*	*æ*	*æ*	*æ*	*I*	*e*
o:	*oʊ*	*ɒ*	-	-	*ɒ*	*ɒ*	*ɒ*	*ɒ*	*ɒ*	*ɒ*
oʊ	*o:*	-	*o:*	-	*au*	*ʊ*	*ʊ*	*ʊ*	*ʊ*	-
ɑʊ	-	-	-	-	-	-	*ʌ*	-	-	-
ɔɪ	*o:*	-	-	-	-	-	-	-	-	-
ɪə	-	*ɛə*	-	-	-	-	-	-	-	-
ɛə	-	*ɪə*	*ɜ*	*ɜ*	*ɜ*	*æ*	-	*eɪ*	-	-
ʊə	*o:*	*oʊ*	-	*oʊ*	*u:*	-	-	-	-	-

1- Successful for more than 75% of instances
2- Successful for fewer than 75% of instances

Table 13. Percentage correct for each vowel and dipthong

	SUBJECT										Number of S's with vowels in error*
	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	
i	53	47	46	40	67	60	33	60	47	40	10
I	73	80	87	93	80	80	87	80	100	100	1
e	40	80	80	50	50	60	30	40	80	90	6
eɪ	100	100	100	100	100	100	100	75	71	86	1
æ	0	0	20	40	0	20	100	0	0	40	9
ʌ	60	0	20	40	20	100	100	60	40	40	8
ə	100	100	100	100	100	100	100	100	100	100	0
ɒ	100	100	100	100	87	87	87	100	100	50	1
ɑ:	67	33	67	100	100	33	50	36	27	82	7
ɜ	36	10	44	55	55	27	0	67	33	67	10
o:	67	67	100	100	67	67	67	40	40	80	7
oʊ	80	100	80	100	80	60	40	67	20	100	4
u	100	100	100	100	100	100	100	100	100	100	0
ʊ	100	100	100	100	100	100	100	100	100	100	0
aɪ	100	100	100	100	100	100	100	100	100	100	0
ɑʊ	100	100	100	100	100	100	75	100	100	100	0
ɔɪ	67	100	100	100	100	100	100	100	100	100	1
ɪə	100	67	100	100	100	100	100	100	100	100	1
eə	100	50	50	50	50	50	100	50	100	100	6
ʊə	67	67	100	67	67	100	100	100	100	100	4
Number of vowels in error*	10	9	6	7	8	8	6	9	8	5	

** Shaded areas indicate phonemes in error using 75% as error limit.*

3. /æ/ is a low, front vowel used in StdSAE but not in Xhosa, where no low, front vowels exist. In terms of accuracy, only one subject (S7) used /æ/ with 100% success. Five subjects (S1, S2, S5, S8, S9) were never able to use /æ/ successfully. The remaining four subjects (S3, S4, S6 and S10) used /æ/ with occasional accuracy. Nguni has three vowels which include some of the features of /æ/:- /i/ and /e/ are both front vowels (high and mid-height respectively) and /ɑ/ has the feature of lowness. The subjects use the other front vowels /e/ or /I/ or a combination of these vowels as primary substitutes e.g. s<u>a</u>id for s<u>a</u>d; s<u>i</u>t

for sat. Thus 'frontness' may be relatively more salient than lowness for the Nguni speaker. There was clear confusion regarding perception of the StdSAE front vowels, /e/; /ɜ/ and /æ/, which is most likely due to underdifferentiation in the Nguni vowel system. As Baetens-Beardsmore (1986) suggests, the effect of underdifferentiation on intelligibility is marked.

Central vowels

4. Long, mid-height and rounded /ɜ:/ is a sound not featured in Nguni phonology. Accuracy rates were variable but generally showed that there is difficulty in communicating the phoneme, as had been suggested by Lanham (1963). S7 never used it with success; S2 and S3 used it successfully for most of the time, and the majority of subjects (6/10) used it successfully only on occasion. Once again, front vowels of StdSAE were called upon in an underdifferentiated way – thus primary substitutes for the target included /æ/ (e.g. bad for bird), /e/ (bed for bird) and /I/ (gym for germ). The substitution of these sounds resulted in listener confusion. /ɜ/ is a rounded vowel and Nguni has a rounded vowel (/o/). It is interesting to note that this vowel was not perceived as a substitute for /ɜ/, suggesting that roundness is a feature of relatively low salience.
5. The mid, central /ə/ vowel caused no difficulties, and was perceived with 100% success by all subjects. This vowel does not form part of the Nguni vowel system but proved non-problematic for readers and their listeners. In English, many full vowels are neutralised to /ə/. This process does not occur in Nguni, and if the vowels' full forms were correctly used instead, intelligibility would not be compromised. An alternative explanation may be that StdSAE listeners expected the /ə/ vowel in certain syllable placements. If one were to measure the acoustic and articulatory parameters used by BSAE speakers in their production of /ə/, one might find that it differs considerably from the StdSAE norm (e.g. as reported by Lanham, 1963). The difference, however, had no impact at a functional level.

6. /ʌ/, the short central vowel, lacking from Nguni phonology was a vowel used with variable success. S2 never used it successfully, whilst S6 and S7 always used it with success. The remaining 7 subjects used it correctly occasionally. The favoured substitute for /ʌ/ was /ɑ/ (as had been suggested by Khumalo, 1984; Bowles, 1994 and Gough, 1996a) which was used by S1, S3, S4, S5 (together with /æ/), S8 and S9 (e.g. cart for cut; heart for hut). Many of the subjects seemed to use these vowels interchangeably since Nguni phonology has no central vowels and /ɑ/ is one of its closest 'neighbours' in the SAE vowel quadrilateral. S10 substituted the back vowel /ɒ/ for /ʌ/ (e.g. dog for dark), and again /ɒ/ is a 'neighbouring' vowel which also features in the Nguni vowel system.

Back Vowels

7. The rounded back vowels /ʊ/ and /u:/ were used with high accuracy rates by all subjects. /u/ is a vowel which occurs in the Nguni vowel system, and despite the predictions based on Flege's Speech Learning Model (1987, 1991, 1995), it seems close enough to its StdSAE equivalent to prove unproblematic. Lanham (1963) has suggested that StdSAE /u:/ may be problematic for BSAE speakers who fail to indicate length characteristics. This may be the case, but at a functional level, no difficulty was noted. /ʊ/ is a novel phoneme, and contrary to predictions posed no difficulties.
8. /o:/ proved somewhat problematic for listeners. Again perhaps due to the fact that it is a long phoneme. S3 and S4 were the only subjects who used /o:/ with 100% success. S1, S2, S5, S6, S7, S8 and S9 were only occasionally successful in their use of /o:/ and S10 was largely successful. All subjects, with the exception of S1 favoured the short back /ɔ/ as their primary substitute (e.g. cot for court), suggesting that the correct vowel component had been selected but the necessary length was lacking. S1 seemed to favour /oʊ/ as a primary substitute (e.g. cold for court) – perhaps a closer approximation in terms of length, to the target.

9. The back vowel /ɔ/ features in Nguni phonology and is similar to the StdSAE /ɒ/. Based on Flege's (1987, 1991, 1995) Speech Learning Model, one would expect this similarity to result in difficulty for BSAE speakers. S5, S6 and S7 used the vowel mostly successfully, and S8 and S10 used it successfully only occasionally. Primary substitutes included the dipthong /oʊ/ (S5, S6 and S10 e.g. r<u>o</u>be for j<u>o</u>b) and /o:/ (S7 e.g. jaw for job). /oʊ/ and /o:/ are both phonemes which had low accuracy rates, and are lacking from Nguni phonology. /ɒ/ was used as a primary substitute for /o:/ by 7 subjects, and /o:/ substituted for /oʊ/ by two subjects (see next page). Thus, there seemed to be a general confusion between these sounds and an underdifferentiation between them which could compromise intelligibility.
10. /ɑ:/ is a low back StdSAE vowel that does not appear in the Nguni vowel system. Subjects used this phoneme with varying degrees of success. S4 and S5 always produced words that were correctly noted; S10 used it mostly correctly. The remaining seven subjects used it correctly only occasionally. Again, this is most likely due to underdifferentiation between this phoneme and other SAE phonemes which are not represented in the Nguni vowel system. /ʌ/, a central vowel that is not used in Xhosa was frequently confused with the longer, more back /ɑ:/ (S1, S8, S9) e.g. h<u>u</u>t for h<u>ear</u>t; d<u>u</u>ck for d<u>ar</u>k. For these subjects the two sounds were perceived interchangeably. Other subjects (S6, S7) may have overcompensated: the /ɑ:/ is consistently realised as /ʌ/ (e.g. S9 uses d<u>u</u>ck for d<u>ar</u>k; h<u>u</u>t for h<u>ear</u>t) and a high degree of success was achieved with /ʌ/. Researchers such as Wade (1996) and Gough (1996a) have noted this same pattern of substitution.

    S2 used /ɒ/ and /æ/ as primary substitutes for /ɑ/; S3 used /ɒ/ and S10 used /e/ as a primary substitute. These should be regarded as idiosyncratic substitutions since there is limited evidence for such trends.

Dipthongs

Flege's Speech Learning Model (1995) predicted that these novel phonemes would prove unproblematic for BSAE subjects. In general, subjects fared relatively well with dipthongs. The dipthong /aɪ/ was used and perceived with consistent success. The insertion of glides into dipthongs (e.g. as suggested by Lanham and Traill, 1965) seemed to have no effect on intelligibility. Those dipthongs which were used with less than 100% success included the following:

a) /oʊ/ was used mostly successfully by three subjects (S1, S3 and S5) and with only occasional success by four other subjects (S6, S7, S8 and S9). The remaining three subjects always used it successfully. The favoured substitutes were /ʊ/ which was substituted by four subjects (e.g. broom for roam); /o:/ which was substituted by two subjects (e.g. aboard for abode); and one subject (S5) used /ɑʊ/ as the primary substitute (e.g. about for abode). The substitution of /ʊ/ and /o:/ supports Lanham and Traills' (1965) hypothesis that dipthongs become monopthongs in BSAE speech.

b) /ɔɪ/ was used with complete success by all subjects with the exception of S1 who used it successfully only occasionally. Her favoured substitute was /o:/ e.g. all for oil. This would seem to be an idiosyncratic phenomenon, although it is consistent with Lanham and Traill's (1965) findings.

c) /ʊə/ was used with complete success by 6 subjects, whilst 4 subjects (S1, S2, S4 and S5) used it successfully only occasionally. The primary substitutes perceived were /oʊ/ (S2, S4 e.g. show for sure); /o:/ (S1 e.g. shawl for sure) and /u/ (S5 e.g. shoe for sure). S1 seemed to favour /o:/ and used this phoneme to represent three different dipthongs.

d) /ɪə/ - S2 was the only subject who experienced difficulty communicating this phoneme. She only occasionally used it with success and for the most part substituted /eə/ in what may be an idiosyncratic process e.g. bear for beer.

e) /ɑʊ/ - S7 was the only subject who experienced difficulty with this phoneme. She substituted the central, shorter /ʌ/ for it (e.g. dumb for town). This may be an

f) idiosyncratic process, but could also reflect the problem Nguni first language speakers have in indicating the feature of length. Again, it supports Lanham and Traill's (1965) suggestion that StdSAE dipthongs become monopthongs in BSAE speech.

g) /eɪ/ - three subjects (S8, S9 and S10) had difficulty successfully communicating this dipthong. S8 and S10 used it mostly successfully and S9 with only occasional success. S8 and S9 favoured the high, front /i/ as their primary substitute e.g. lean for lane. This is a long front sound and seems a logical choice to replace the relatively front dipthong. S10 favoured another dipthong /aɪ/ as a primary substitute (e.g. fight for fate).

h) /eə/ was used with complete success by S1, S7, S9 and S10. The remaining six subjects used it successfully only on occasion. The favoured substitutes perceived were /ɜ/ (S3, S4, S5 e.g. chirp for chair; her for hair); /ɪə/ (S2 e.g. hear for hair); /eɪ/ (S6 e.g. hay for hair) and /aɪ/ (S8 e.g. child for chair). /ɜ/ seems to be a logical choice as substitute as it contains similar length and place features to the target. The choice of /ɪə/; /eɪ/ and /aɪ/ by other subjects shows awareness of the need to convey length characteristics. The use of /æ/ by S6 may be idiosyncratic. This subject favoured the phoneme /æ/ as primary substitute for two other targets.

Summary

The pooled data for all subjects, summarised in the confusion matrix (Table 14), underlines the trends in substitution errors. Only incorrect productions are included. The category 'other' contained sounds that were omitted from subjects' responses. All words containing errors on vowels or dipthongs are listed in Appendix 5. Error trends for vowels and dipthongs include the following:

1. /i:/ and /I/ confusion due to length characteristics of the former. /i:/ was frequently perceived as /I/; and to a lesser extent /I/ was perceived as /i:/.
2. /o:/ and /ɒ/ confusion due to length distinction. /o:/ → /ɒ/.
3. Confusion in perception of the following vowels:

a) /e/ became /æ, ɜ, ėɪ/

b) /æ/ became /e, I/

c) /ɜ/ became /æ, e/

4. Central /ʌ/ and /ɑ:/ underdifferentiated i.e. /ʌ/ → /ɑ:/; /ɑ:/ → /ʌ/. This was a source of confusion for listeners.
5. Dipthongs largely used with success. The more problematic ones included:

a) /oʊ/ → /ʊ, o:/

b) /eə/ → /ɜ/

c) /ʊə/ → /oʊ/.[11]

[11] Results for /ʊə/ and /oʊ/ are potentially misleading and should be interpreted with caution, since there were only two opportunities for subjects to use them in the study. Future studies might examine these dipthongs more closely.

Table 14. Confusion matrix for vowel substitution errors

TARGET \ PERCEIVED AS	i	ɪ	e	eɪ	æ	ʌ	ə	ɒ	ɑ:	ɜ	o:	oʊ	u	ʊ	aɪ	aʊ	ɔɪ	ɪə	eə	ʊə	other
i		68	2	1								2									
ɪ	19		1		1																
e				7	14					11	2	2	2					1	1		
eɪ	2														3						
æ		17	19	2		1															
ʌ			1		5			4	16												
ə																					
ɒ											2	3									
ɑ:					4	14		5		2											
ɜ		3	21	5	21	3		1			6				1			5	1		
o:								8				1									
oʊ											6		1	8		1					
u														1							
ʊ												2									
aɪ																					
aʊ						1															
ɔɪ											1										
ɪə																			1		
eə				1	1					2					1			1			
ʊə											1	2		1							

Consonants

Error analysis

BSAE subjects were highly successful in communicating consonants to their listeners, and accuracy rates for consonants were higher than those for the vowels and dipthongs. Accuracy levels and primary substitutes for S1-S10 are presented in Table 15. Primary substitutes were listed only where one or more subjects had had the sound classed in

the 'occasional success' category i.e. had been successful in less than 75% of instances of use. Table 16 presents the percentage of correct perceptions for each consonant for each subject.

As shown in Table 15, all subjects showed evidence of all StdSAE consonants in their inventories, and no subject was entirely unsuccessful in using any one of the consonants.

Using 75% as a cut off point for consonants considered in error (Table 16), it was found that one subject had 5 consonants in error (S6); two subjects had 3 consonants in error (S2, S10); three subjects had 2 consonants in error (S1, S7 and S9); three subjects had only one consonant in error (S4, S5 and S8); one subject (S3) had no consonants in error.

The consonants most frequently in error were /j/ and /ɪŋ/ (incorrect for 6 subjects); /ð/ (incorrect for 3 subjects) and /k/ (incorrect for 2 subjects). One subject had difficulties with each of the following consonants: /f/, /d/ and /n/. All words containing consonantal errors are listed in Appendix 6. The most frequently occurring errors are discussed in the sections which follow. Consonants are grouped into categories according to manner of production.

Glides

1. The glide /j/ was used with only occasional success by six subjects (S1, S2, S6, S7, S8, S9). S3, S4, S5 and S10 always managed to use it successfully. The primary substitute was the glottal /h/ e.g. hen for yearn, hers for yes. In terms of distinctive features, both sounds are sonorant continuants (McReynolds and Engmann, 1975). /j/ is high, whilst /h/ is low. The /j/ sound was also deleted by S8 on some occasions, e.g. earn for yearn.

Table 15. Individual subject profiles: consonants

Subject	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10
Accuracy Rates										
Always Successful	/b/; /m/ /w/; /f/; /ʃ/; /v/ /θ/; /n/ /dʒ/; /ð/ /k/; /g/; /h/	/p/; /m/; /w/ /v/; /θ/ /d/; /ʃ/; /ð/ /dʒ/; /r/ /g/; /h/	/p/; /w/; /f/ /v/; /ð /; /θ/ /d/; /s/; /h/ /z/; /l/; /ʃ/ /tʃ/; /dʒ/ /j/; /r/; /k/ /g/; /ŋ/	/p/; /b/; /w/ /f/; /v/; /d/ /θ/; /s/; /z/ /l/; /ʃ/ /tʃ/; /dʒ/ /j/; /r/; /k/ /ŋ/; /h/	/p/; /b/; /m/ /w/; /ð /; /θ/ /ʃ/; /dʒ/; /s/ /z/; /l/ /r/; /k/ /g/; /h/	/b/; /m/; /d/ /f/; /z/; /l/ /w/; /tʃ/ /dʒ/; /r/ /g/; /h/	/p/; /m/; /w/ /f/; /v/; /θ/ /ð/; /z/; /s/ /l/; /ʃ/ /tʃ/; /dʒ/ /k/; /h/	/p/; /m/; /w/ /f/; /v/; /θ/ /z/; /l/; /ð/ /l/; /tʃ/ /dʒ/; /r/ /ŋ/	/p/; /w/;/v/ /ð/; /θ/ /f/; /z/; /l/ /tʃ/; /r/ /h/	/m/; /w/ /l/; /ʃ/ /dʒ/; /j/ /ŋ/; /h/
Mostly[1] successful	/p/; /t/; /d/ /s/; /z/; /l/ /tʃ/; /r/	/b/; /s/; /d/ /t/; /z/; /n/ /tʃ/	/b/; /m/; /t/ /n/	/m/; /t/; /n/ /g/	/f/; /v/; /d/ /n/; /dʒ/	/p/; /v/; /θ/ /t/; /s/; /k/	/b/; /t/; /d/ /n/; /r/; /g/	/b/; /t/; /d/ /s/; /n/; /ʃ/ /k/; /g/; /h/	/b/; /m/; /t/ /d/; /s/; /n/ /ʃ/; /dʒ/ /k/; /g/	/p/; /b/ /v/; /θ/ /t/; /d/ /s/; /z/ /n/; /tʃ/ /r/; /g/
Occasionally[2] successful	/j/; /ŋ/	/j/; /k/ /ŋ/	-	/ð/	/ŋ/	/ð/; /d/ /n/; /j/; /ŋ/	/j/; /ŋ/	/j/	/j/; /ŋ/	/f/; /ð/ /k/
Primary substitutes										
Target										
f	-	-	-	-	*p*	-	-	-	-	*b*
ð	-	-	-	*d*	-	*d*	-	-	-	*d*
d	*t*	*t*	-	-	*t*	*t*	*t*	*t*	*t*	*t*
t	*d*	*d*	*d*	*d*	*d*	-	*d*	*d*	*d*	*d*
n	-	*#[3]*	*#*	*l*	*l*	*m/#*	*m/#*	*m*	*m*	*m*
j	*h*	*h*	-	-	-	*h*	*h*	*h/#*	*h*	-
k	-	*g*	-	-	-	*g*	-	*g*	*g*	*g*
ŋ	*nk*	*n*	-	-	*n*	*n*	*n*	-	*dʒ*	-
b	-	*h*	*h*	-	-	-	*#*	*d*	*h*	*h/#*
s	*z*	*z*	-	-	-	*z*	-	*z*	*z*	*z*

1. *Successful for more than 75% of instances.*
2. *Successful for fewer than 75% of instances.*
3. *Phoneme deletion.*

Table 16. Percentage correct for each consonant

	SUBJECT										# of S's with errors*
	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	
p	87	100	100	100	100	87	100	100	100	93	0
b	100	93	79	100	100	100	93	93	93	86	0
m	100	100	89	89	100	100	100	100	89	100	0
w	100	100	100	100	100	100	100	100	100	100	0
f	100	100	100	100	91	100	100	100	100	70	1
v	100	100	100	100	75	75	100	100	100	75	0
θ	100	75	100	100	100	75	100	100	100	75	0
ð	100	100	100	50	100	50	100	100	100	50	3
t	85	92	92	77	100	96	96	88	96	92	0
d	87	78	100	100	96	65	91	78	87	83	1
s	93	96	100	100	100	93	100	93	89	96	0
z	83	83	100	100	100	100	100	100	100	83	0
n	100	77	82	92	85	69	85	85	77	77	1
l	92	100	100	100	100	100	100	100	100	100	0
ɹ	100	100	100	100	100	100	100	80	80	100	0
tʒ	87	87	100	100	100	100	100	100	100	87	0
dʒ	100	100	100	100	75	100	100	100	75	100	0
j	67	33	100	100	100	33	67	33	67	100	6
r	89	100	100	100	100	100	89	100	100	89	0
k	100	61	100	100	100	92	100	92	92	61	2
g	100	100	100	89	100	100	89	89	89	89	0
ŋ	50	50	100	100	50	50	50	100	50	100	6
h	100	100	100	100	100	100	100	86	100	100	0
Number of consonants in error*	2	3	0	1	1	5	2	1	2	3	

* *Shaded areas indicate phonemes in error using 75% as error limit.*

Nasals

2. The nasal /ŋ/[12], a phoneme which does occur in Xhosa phonology, was used with occasional success by six subjects and was always used with success by the remaining four. In most cases it was reduced to /n/ (S2, S5, S6 and S7) e.g. ra<u>n</u> for ra<u>ng</u>. Both /ŋ/ and /n/ are sonorant, consonantal nasal sounds. They differ in terms of place: /ŋ/ is produced high and back in the oral cavity and /n/ is produced more interiorly. S1's pronunciation of /rang/ was heard as /drink/ suggesting that

[12] /ŋ/ is limited to a medial and final position in StdSAE and was used in only two words in the study. Figures for this phoneme in Tables 16 and 17 should thus be viewed with caution.

there may have been word final devoicing. S9's production of that same word was perceived as 'rage.' /ɲ/→ /dʒ/ may be an idiosyncratic error.

3. The alveolar nasal /n/ proved problematic for S6 who used it with only occasional success. For the majority of subjects (8/10) this sound fell in the category of 'mostly successful.' S1 used it with consistent success. The bilabial nasal /m/ was the favoured substitute (e.g. came for cane) used by five subjects. /m/ and /n/ share voicing and manner characteristics and differ only in terms of place: /m/ is a bilabial sound and /n/ is alveolar and has the feature + coronal in terms of Chomsky and Halle's (1968) system. S4 and S5 favoured another alveolar sound, /l/ as a substitute for /n/ (e.g. fail for fern; life for knife). /n/ in the word final position was frequently deleted by subjects (e.g. lay for lane). This is another example of the way in which final sounds can be reduced when Nguni phonotactic structure is applied to English.

Plosives

4. /k/ proved problematic for only two subjects (S2 and S10) who were only occasionally successful when they used this phoneme. They inserted /g/ for /k/ - S2 in the word final position only (e.g. dog for dark) and S10 both word finally and initially (e.g. game for cane). S6, S8 and S9 were mostly successful in their attempts to convey this sound and their errors appear to be word-specific viz. things for thinks. The remaining five subjects were always successful.
5. /d/ was always used with success by two subjects (S3 and S4). It fell into the category of 'mostly successful' for the majority of subjects (7/10). One subject (S6) used it correctly only occasionally. All subjects favoured the voiceless /t/ as a primary substitute for /d/. This was usually limited to the word final position in a process termed word final devoicing e.g. root for rude; wet for wed. The Nguni languages are phonotactically structured so that all syllables and words end openly with vowels (Mowrer and Burger, 1991). English words may have open or closed syllable structures. It seems that BSAE subjects imposed their L1 phonotactic knowledge onto English words (as described by Khumalo, 1984) and that consonants in word final position were vulnerable to either deletion or devoicing.

6. All subjects with the exception of S6 had /t/ falling in the category 'mostly successful.' The favoured substitute was the voiced counterpart /d/. e.g. fade for fate; hard for heart. The substitutions all took place word finally, and this may have resulted because listeners were aware of the *possibility* of word final devoicing, or because the BSAE readers overcompensated in their production of word final sounds which they knew could prove potentially problematic. S6 used /t/ with consistent success.
7. The bilabial plosive /b/ was not very problematic for any of the subjects, and /b/ was used with consistent success by four of the subjects (S1, S4, S5 and S6). The remaining subjects had the phoneme falling in the category 'mostly successful.' It is interesting to note that /h/ was the favoured substitute for S2, S3, S9 and S10 who used it word initially only (e.g. here for beer; hook for book). /h/ and /b/ share no features in terms of manner, place or voicing characteristics. S7 and S10 frequently deleted /b/ in the word final position (e.g. jaw for job). S8 favoured /d/ as the primary substitute (e.g. dead for bed) which seems most likely to be an idiosyncratic process and is certainly not a trend across all subjects.

Fricatives

8. The voiced interdental /ð/[13] does not appear in Nguni phonology. Three subjects (S4, S6 and S10) used it with occasional success. These subjects all substituted /d/ for /ð/. The two sounds share the same features and are distinguished only by manner: /ð/ is a continuant and /d/ is not. The majority of subjects (7/10) used /ð/ with consistent success.
9. The majority of subjects (8/10) used the dental fricative /f/ with consistent success. S5's production of /f/ fell in the category 'mostly successful.' She occasionally favoured /p/ as a substitute (e.g. paint for fate). This idiosyncratic process may be termed stopping. S10 used /f/ with occasional success and favoured another bilabial plosive, /b/ as a substitute (e.g. burn for fern). Again, this is an idiosyncratic example of the stopping process.

[13] As for /ŋ/, there were also limited opportunities to use /ð/ in the study.

10. /s/ fell into the category 'mostly successful' for six subjects and the remaining four subjects achieved consistent success with this phoneme. Subjects in the former group favoured its voiced counterpart /z/ and the substitution mostly occurred in the word final position (e.g. things for thinks) although also on occasion in word initial position (e.g. zip for sip).

Phonological Process Analysis

Consonantal errors were analysed in terms of phonological processes. The processes identified and discussed by Ingram (1981) and Grunwell (1982) were used as a basis for this analysis. The most prominent processes used by each subject are presented in Appendix 7. McReynolds and Elbert (1981) suggest that in order for a process to be regarded as part of an individual's phonological system, quantitative criteria need to be met. These authors suggested that there should be evidence of a process operating for at least 20% of the instances where it could operate. In this study, none of the subjects met this criteria in terms of consonants –and this is not surprising when examining the high percentage scores achieved.

Despite the lack of quantitative evidence, certain qualitative trends are evident in the results. Six of the subjects showed evidence of word final devoicing and five subjects showed evidence of word final voicing, making these the most commonly used processes. The error matrix in Table 17 shows the confusion between voiced and voiceless pairs such as /t/ and /d/; /k/ and /g/ and to a lesser extent /s/ and /z/. The phonological process analysis is useful in that it indicates the word position where the confusion consistently occurred. Three of the subjects used both the word final devoicing and voicing prominently (S1, S2, S8). Subjects 4 and 9 used the voicing process prominently as opposed to S6, S7 and S10 who used the devoicing process consistently. S3 and S5 used neither of these processes.

Devoicing of final consonants is a process that can be accounted for in terms of Nguni phonotactics. BSAE subjects applied the constraints of Nguni syllable structure to the English words and this placed consonants in word final position under pressure for devoicing or, in some cases, complete deletion. English words may have an open or closed syllable structure, and words may end with voiced or voiceless consonants. These differences between BSAE speakers' L1 and L2 could have resulted in the

potential for confusion. In this study, word final devoicing was one of the most prominent sources of listener confusion. Together with word final voicing which also occurred, it seems to reflect a general confusion regarding the perception of final consonants. Final consonant deletion was used prominently by three subjects (S3, S7 and S9).

Initial consonant deletion was used with some regularity by only one subject, S8. The substitution of the glottal /h/ was used by several subjects (S2, S3, S9 and S10). These subjects used /h/ to replace both /b/ and /j/.

Distinctive Feature Analysis

The Distinctive Features of Chomsky and Halle (1968) were used to further analyse the speech of subjects. The complete results of the analysis are presented in Appendix 8. Findings from this type of analysis suggest that the most problematic feature was the +/- voice distinction. This type of analysis is applicable only to phonemic substitutions and it is also limited in terms of the information it provides on word position. Devoicing was more prominent than voicing.

The place distinction of height was also problematic: phonemes with the feature + high were frequently perceived as less high sounds, e.g. /j/ is + high and was realised as /h/ which is – high; /ŋ/ is + high and was realised as /n/ which is – high.

Other features such as +/-nasality, +/- back, +/- continuant and +/- strident were relatively common in terms of errors but the error patterns did not appear consistently.

Summary

Consonantal errors were relatively few and seem to play a lesser role in miscommunication than the vowel sounds. Difficulties noted in this section typically occurred in only a few instances or for only one subject. The pooled data for all subjects underlines the trends in substitution errors, and these are summarised in the confusion matrix in Table 17. Only incorrect productions are included. The category 'other' contains sounds that were entirely omitted from subjects responses. The most predominant errors are summarised below.

Individual sound substitutions

1. Glide /j/ became glottal /h/ (glottal substitution).
2. Nasal /ŋ/ became /n/.
3. Voiced interdental /ð/ became /d/.

Table 17. Confusion matrix for consonant substitution errors.

TARGET \ PERCEIVED AS	p	b	m	w	f	v	θ	ð	t	d	s	z	n	l	ɾ	tʃ	dʒ	j	r	k	g	ŋ	h	other
p		1				2														2				
b										1													6	2
m														1										2
w																								
f	1	2							1															
v				1					1															1
θ					1				2															
ð										3														1
t	2						2			17														1
d									31															
s												11												
z											3													
n			9											4										9
l								1																
ɾ																	1							1
tʃ														3										
dʒ																1			1					
j																							8	1
r																							1	2
k																					8	0	1	4
g																				1				2
ŋ													5				1							1
h																								1

Error classes for sound groups

Voicing and devoicing were the source of the most confusion. More specifically,

4. Both devoicing and voicing of alveolar stops /t/ and /d/ occurred. /d/ was devoiced in the word final position to /t/. /t/ was voiced in the word final position to /d/.
5. Word-final consonant voicing of velar stop /k/: Voiceless velar /k/ was perceived as voiced velar /g/ word finally.
6. Word-initial and word-final voicing of alveolar fricative /s/: /s/ perceived as voiced /z/.

Evaluation

Findings of the present study suggest that the main difficulties which BSAE speakers experienced when communicating a list of words to StdSAE speakers, were related to the vowel characteristics of words.

Underdifferentiation is likely to account for the problems experienced as Xhosa speakers attempted to map the more complex and more numerous StdSAE vowels onto their L1's 5 vowel system. Results of this study suggest that the following vowel and dipthong perception errors, and to a lesser extent consonant perception errors, lead to miscommunication. They are classed as Level 1 or functional level difficulties because they have the capacity to affect meaning. The features listed below do not appear in order of prominence, but rather in the order in which they were discussed in the text.

Level 1: Functional 'Errors' of BSAE Speech

/i/→/I/, and to a lesser extent /I/→/i/. The inability of BSAE speakers to assign length to long vowels has been consistently noted from the earliest research by Lanham in the 1960's to more recent research in the present decade (Lanham, 1963; Buthelezi, 1989; Gough, 1996a; Wade, 1996). The phonemes /i/ and /I/ seem to provide the clearest example of this characteristic.

/o:/→/ɒ/. This is another example of the confusion that arises due to lack of length distinction. It has also been consistently noted throughout BSAE research e.g. Lanham, 1963; Wade, 1996.

/æ, ɜ, eɪ/→/e/. As early as 1967, Lanham suggested that the StdSAE vowels /e, æ, ɜ/ are merged to /e/. Later researchers such as Khumalo (1984), Glaser (1995) and Gough (1996a) found similar patterns of underdifferentiation, and again these were found in the present study. Lanham and Traill (1965) suggested that many of the StdSAE dipthongs are realised by BSAE speakers as monopthongs, as for /eɪ/→/e/. This characteristic has also been found by later researchers (e.g. Gough, 1996a) as well as in the present study.

/æ/→/e, I/. The present study revealed the front vowel /æ/as a source of great confusion for listeners to BSAE speech. /æ/ was frequently perceived as /e/ (as noted above). Other authors (e.g. Bailey, in Wade, 1996) have suggested that /æ/ is variably produced as /e/ or /ʌ/. In the present study it was also found that /æ/ was most frequently perceived as the front vowels /e/ or /I/.

/ɜ/→/æ, e/. Previous research has suggested that /ɜ/→/e/ (e.g. Khumalo, 1984; Glaser, 1995; Bailey in Wade, 1996; Gough, 1996a). In the present study it was found that /ɜ/ is variably perceived as /æ/ and /e/.

/ʌ/→/ɑ/; /ɑ/→/ʌ/. Previous researchers (e.g. Bowles, 1994 and Bailey (in Wade, 1996) have agreed that /ɑ/ and /ʌ/ are typically both realised as /ʌ/ in BSAE speech. In the present study a general confusion in the perception of the two sounds was noted.

/oʊ/→/ʊ, o:/. Lanham and Traill (1965) suggested that many of the StdSAE dipthongs are realised by BSAE speakers as monopthongs, and suggested /eʊ/→/o/ as an example of such a process. Khumalo (1984), Gough (1996a) and Bailey (in Wade, 1996) all found evidence of such simplification in their studies. In the present study it

was found that /ɐʊ/→/ʊ, o:/. In terms of the /ʊ/ phoneme, this follows the principles suggested by authors such as Lanham and Traill (1965) and Wade (1996) where the dipthong is reduced to a single vowel. /o:/ may have been produced by the BSAE subjects in an attempt to produce a longer vowel. This study was concerned primarily with perception, as opposed to production, and StdSAE listeners may have expected a longer phoneme and hence perceived the /o:/ phoneme, in the place of the dipthong.

/eə/→/ɜ/. Authors such as Khumalo (1984) and Wade (1996) have suggested that /eə/→/e/. In the present study it was found that /eə/ was most frequently perceived as /ɜ/.

/ʊə/→/oʊ/. Previous studies have not mentioned this dipthong substitution, which may be a new contribution to research on features of BSAE, or it may be idiosyncratic to the small numbers of subjects, or particular words in the study. Further research is required to determine the status of this phoneme in BSAE.

/j/→/h/ (glottal substitution). Previous research has not made mention of difficulties in the production of /j/ by BSAE speakers. Speakers with Afrikaans as their L1 may produce these phonemes interchangeably in certain contexts (e.g. consider the production of /hɪə/ and /jɪə/ for HERE). This may have influenced both the production and perception of the sounds by the subjects in the study.

/ŋ/→/n/. To the author's knowledge, no previous studies of BSAE have indicated difficulties with the phoneme /ŋ/. However, the production of /n/ for /ŋ/ is a common occurrence in many varieties of English (Grunwell, 1982). In the present study /ŋ/ proved to be one of the most problematic phonemes which affected the communication of meaning, and it was most frequently realised as /n/. This substitution may not be problematic when used in isolation, but in BSAE where a range of others substitutions occur, it may further compound communication difficulties. As previously acknowledged, there were limited opportunities for subjects to use the sound and further research will be required to determine its status in BSAE more accurately.

/δ/→/d/. Previous studies (e.g. Khumalo, 1984; Jacobs, 1994 and Gough, 1996a) have suggested that /t/ and /d/ might be used to replace their interdental counterparts in BSAE. In this study, /δ/→/d/ only was found to be problematic. Some authors (e.g. Gough, 1996a) have suggested that the feature is a basilectal one. Further research will be required to determine the pervasiveness of this feature throughout all varieties of BSAE.

/d/→/t/ (word finally); /t/→/d/ (word finally); /k/→/g/ (word finally); /s/→/z/(word finally, word initially). Many researchers (e.g. Khumalo, 1984; Gough, 1996a) have suggested that word final devoicing is characteristic of BSAE speech, and of L2s more generally (van Rooy, 1995). In the present study, this was to some extent, confirmed. /d/ was devoiced to /t/ word finally, and on many occasions the reverse occurred so that the voiceless final sound was perceived as voiced. This may reflect the BSAE speakers attempts to compensate for what they realise is an area of difficulty, or it may reflect the listeners' taking these factors into account when hearing the BSAE speech. In any event, the result is confusion and miscommunication of the single words. For the phonemes /k/ and /g/, word final voicing proved most problematic as /k/→/g/ most often. /s/ was frequently perceived as its voiced counterpart /z/, both word finally and word initially. Jacobs (1994) had noted that /z/→/s/ more frequently in her study.

Summary

A re-examination of previous studies presented in Table 5 suggests that:

(a) the findings of the present study are not entirely new. For the most part they confirm previous findings on features of BSAE phonology. Some new features were noted, and these will require further investigation, with a larger number of subjects, to determine their true status in BSAE.

(b) the features of BSAE speech highlighted in this study are all Level 1 features. Thus it is hypothesised that the remaining features of BSAE noted in Table 5 most likely represent Level 2 (aesthetic or non-meaning related) features.

The composite listing of BSAE features presented in Table 5 (p. 21) was re-examined in the light of the functional difficulties found in the present study. All features which resulted in listener confusion in the present enquiry were classed as Level 1 features. The remaining features were designated as Level 2 features. Table 18 shows this classification.

Table 18. Listing of possible features of BSAE and classification into 'error' levels.

Vowels	**Error level**
1. Inability to assign length feature to long vowels so that: a) /i/ and /I/ -> /I/ (or alternatively /i/ and /I/ -> /i/) b) /u:/ and /ʊ/ -> /u/ c) /ɒ/, /ɔ/ and /o:/ -> /o/.	Level 1 Level 2 Level 1
2. Absence of mid and high central vowels viz. /ɜ/ and /ə/.	Level 1 for /ɜ/. Level 2 for /ə/.
3. Inability to maintain stress contrasts. a) Unstressed /ə/ is realised as /ɑ/, or b) /ə/ -> /ɑ/, /i/, /e/ or /u/.	Level 2 Level 2
4. Confusion between /ɑ/ and /e/.	Level 2
5. /æ/, /e/ and /ɜ/->/e/.	Level 1
6. /ʌ/, /ɑ/ and /ə/-> /ɑ/.	Level 1 for /ʌ/. Level 2 for /ə/.
7. /eə/ -> /e/.	Level 1
8. /æ/, /ɑ/ and /ʊ/ -> /a/.	Level 2
9. An overly tense basis of articulation.	Level 2
Dipthongs	**Error level**
1. Some dipthongs tend toward monopthongs a) /eɪ/ -> /e/ b) /oʊ/ -> /o/	Level 1 Level 1
2. Some dipthongs (the broader ones) are realised as sequences of simple vowels a) /aɪ/ -> /ai/ b) /ɑʊ/ -> /au/ c) /ɔɪ/ -> /ɔi / d) /ɪə/ -> /iɛ / [ie ~ ia] e) /ʊə/ ->/ua /.	Level 2 Level 2 Level 2 Level 2 Level 2

Table 18 continued.

3. Other dipthongs (the narrow ones) are extended over two syllables and separated by glides a) /aɪ/->/ajɪ/ b) /aʊə/ -> /awa/ c) /ʊə/ -> /uwa/ d) /eʊə/ -> /owa/ e) /ɪə/ -> /ija/.	Level 2 Level 2 Level 2 Level 2 Level 2
Consonants	**Error level**
1. Interdental /θ/ and /ð/ are replaced by alveolar /t/ and /d/ (may be a basilectal feature).	Level 1
2. Devoicing of obstruents /b/, /d/, /g/, /dʒ/ and /z/ - especially in word final position.	Level 2 except /d, g/
3. Devoicing of stops in word final position.	Level 1 for /g,d,z/
4. May be confusion between approximants /r/ and /l/ (although may be specific to L1 Zulu speakers).	Level 2
5. /tʃ/ -> /ʃ/ (occasionally).	Level 2
6. Generally trilled /r/.	Level 2
7. Stops have later voice onset time.	Level 2
8. /ʒ/ ->/dʒ/.	Level 2
9. Simplification of consonant clusters by insertion of epenthetic vowel e.g. /strɪp/->/sterɪp/.	Level 2
10. Epenthetic vowel inserted in place of syllabic consonants /n, m, l/ e.g. /botl/->/botel/.	Level 2

In this paper it has been suggested that features of BSAE can be divided into two distinct categories, and that this will be a useful way for speech and language therapists to conceptualise their involvement in the area. The experimental task in this preliminary study was designed to identify Level 1 features which resulted in listener confusion. By inference, it has been suggested that the remaining features may be Level 2 features which do not affect functional communication. Further research will be required to determine if this is the case.

Researchers such as Lass (1995) and Wade (1996) have suggested that the distinct accent associated with BSAE is due largely to vowel pronunciation. Table 18 indicates that many of the vowel features can be regarded as Level 1 features, whilst a lesser proportion of dipthong and consonantal errors affect the meaning level.

A listing of Level 1 and Level 2 features is presented in Table 19 and includes the new features noted in this study. Further investigations will be required to determine whether these previously undocumented features are consistent features of BSAE phonology, and whether the features have been correctly assigned to the two levels.

Some of the features described by other researchers in Table 4 (p. 16) were thought to be specific to L1 Zulu speakers (e.g. Confusion between /r/ and /l/ (Bailey, in Wade, 1996)). Such features would not have been used by the Xhosa L1 subjects in this study, and thus although they are reflected in Tables 18 and 19 as Level 2 features, they may constitute Level 1 features for L1 Zulu speakers.

Table 19. Functional Classification of BSAE features.

Level 1 – Functional Level Difficulties. ***These features of BSAE are thought to have the potential to alter the meaning of single words in StdSAE. * indicates that features relate specifically to the present study.***

1. Inability to assign length feature to long vowels so that /i/ and /ɪ/ -> /ɪ/, and to a lesser extent /i/->/ɪ/.
2. Inability to assign length feature to long vowels so that /ɒ/, /ɔ/ and /o:/.
3. Absence of mid and high central vowel /ɜ/.
4. /æ/, /e/ and /ɜ/ ->/e/. */æ/ also to /ɪ/. */ɜ/ also to /æ/.
5. /ʌ/ and /ɑ/ -> /ɑ/. *Also /ʌ/ and /ɑ/ -> /ʌ/.
6. /eə/ -> /e/ or */ɜ/.
7. */ʊə/->/oʊ/.
8. Some dipthongs tend toward monopthongs e.g. /oʊ/ -> /o/ or /ʊ/ or /o:/) ; /eɪ/ -> /e/.
9. Interdental /θ/ and /ð/ are replaced by alveolar /t/ and /d/.
10. Devoicing of /d/ and /g/ in word final position.
11. *Voicing of /t/ and /k/ in word final position.
12. *Voicing of /s/ to /z/ in both word final and initial positions.
13. */j/->/h/.
14. */ŋ/->/n/.
15. /ð/->/d/.

Level 2 – Aesthetic Level Difficulties. ***These features of BSAE may characterise the distinct dialect and distinguish it from StdSAE at an aesthetic level. However, they seem to have a lesser effect on intelligibility than the features listed above.***

1. Inability to use length contrast so that /u:/ and /ʊ/ -> /u/.
2. Absence of /ə/.
3. Inability to maintain stress contrasts.
   a) Unstressed /ə/ is realised as /ɑ/, or
   b) /ə/-> /ɑ/, /i/, /e/ or /u/.
4. Confusion between /ɑ/ and /e/.
5. /ə/ -> /ɑ/.
6. An overly tense basis of articulation.
7. /æ/, /ɑ/ and /ʊ/ -> /a/.
8. The broader dipthongs are realised as sequences of simple vowels
   a) /aɪ/ -> /ai/
   b) /ɑʊ/ -> /au/
   c) /ɔɪ/ -> /ɔi /
   d) /ɪə/ -> /iɛ / [ie ~ ia]
   e) /ʊə/ ->/ua /
9. Others (the narrow ones) are extended over two syllables and separated by glides
   a) /aɪ/->/ajɪ/
   b) /aʊə/ -> /awa/
   c) /ʊə/ -> /uwa/
   d) /eʊə/ -> /owa/
   e) /ɪə/ -> /ija/.
10. Devoicing of obstruents /b/, /dʒ/ and /z/ in word final position.
11. Confusion between approximants /r/ and /l/.
12. /tʃ/ -> /ʃ/.
13. Generally trilled /r/.
14. Stops have later voice onset time.
15. /ʒ/ ->/dʒ/.
16. Simplification of consonant clusters by insertion of epenthetic vowel e.g. /strɪp/->/sterɪp/.
17. Epenthetic vowel inserted in place of syllabic consonants /n, m, l/ e.g. /botl/->/botel/.

Evaluation of Flege's Speech Learning Model

Hypotheses made regarding BSAE features and Flege's Speech Learning Model (1987, 1991, 1995) were partially proved. StdSAE phonemes which are similar to those of Xhosa were expected to be maximally problematic in the study. Whilst this was the case with /i:/, /o:/ and /ɑ:/, other vowels in this category (e.g. /ɒ/, /ʊ/, /u:/) did not pose particular difficulties. All ten BSAE subjects produced /i:/ in error, and 7/10 subjects had /o:/ and /ɑ:/ erroneously perceived. On the other hand, all subjects had /ʊ/ and /u:/ consistently correctly perceived, and only one subject's production of /ɒ/ was considered in error. It was predicted that a different realisation of /h/ in Xhosa as compared to English (Mowrer and Burger, 1991) might render it problematic. This was not found to be the case, as all subjects with the exception of one used it with consistent success. S8 used it mostly successfully.

Novel sounds were not expected to be problematic for BSAE speakers. However, in the present study, all novel sounds with the exception of unstressed /ə/ and /I/, proved problematic and resulted in miscommunication. Such phonemes included /æ/, /I/, /ʌ/ and /ɜ/, and the results in Tables 12 and Table 13 clearly show the difficulties that occurred. /ə/ was perceived correctly in all instances, and only one subject's /I/ was considered in error (see Table 13).

Dipthongs do not occur in the Nguni language and these sounds were novel for BSAE subjects. In general, the dipthongs did not prove problematic for BSAE subjects. The dipthongs /ʊə/and /eə/ were exceptions which proved problematic for a total of 4 and 6 subjects respectively.

It was predicted that the novel interdental phonemes /ð/ and /θ/ would prove problematic for BSAE subjects. The incorrect production of these sounds is also a feature of BSAE frequently cited (e.g. Khumalo, 1984; Jacobs, 1994; Gough, 1996a). The present study found that /θ/ was used with consistent success, whilst /ð/ was used with less success and was considered in error for 3 subjects.

Sounds which are the same in a speaker's L1 and L2 were expected to pose little difficulty. Whilst this was true for some sounds (e.g. /ɔ/), for the vowels /e/ and /a/ it was not. /e/ and /a/ were considered in error for 6 and 7 subjects respectively. This

may reflect the nature of the task: as listeners became aware of underdifferentiation, they may have made guesses about the target. BSAE subjects consistently realised a group of StdSAE phonemes as one sound (e.g. /æ/, /ɜ/, /e/ → /e/) and it became difficult to distinguish the 'real' /e/.

Inevitably, the findings reflect the nature of the experimental task. Phonetic and acoustic parameters of BSAE were not examined, and speakers may have experienced difficulties in approximating finer phonetic aspects of StdSAE pronunciation. Phonological perception is not an absolute, but is categorically based. Where realisations fell within appropriate categories, word meaning was preserved. Predictions based on Flege's model may have proved more accurate if a less functional paradigm was used.

Flege's Speech Learning Model is to date the most comprehensive model of phonological interference available. Descriptive data such as that obtained in the present study, are useful to evaluate the model. In this present research of BSAE, it seems that Flege's model is of limited use in a functional, clinical context for developing guidelines of sounds which may or may not prove problematic. The model may be useful for understanding some universal aspects of phonological interference, but it cannot account for the specific phonological and phonotactic relationship between any two given languages.

IMPLICATIONS

Towards principled decision making: phonological therapy with BSAE clients

This section of the paper presents possible guidelines for therapists working with BSAE clients, based on findings of the present study. The present study aimed to elucidate the field of clinical speech and language therapy in terms of its involvement with BSAE speaking clients. BSAE features, from previous research studies and together with some new findings from the present study, were divided into two distinct levels. These could provide the speech and language therapist with a framework for involvement with these clients. Firstly, s/he must evaluate the needs of the client and determine at which level/levels the focus of therapy will be. Both therapist and client need to have a clear understanding of the intended outcome of therapy. Results of the present study, as summarised in Table 19, provide the therapist with "normative" data regarding the *types of features* that might be addressed at each level once a rationale for therapy has been established.

Grunwell (1992) notes that in seeking to establish principles of decision making in clinical practice, one attempts to delineate a set of guidelines whereby the clinician can identify explicitly, justifiably and confidently treatment goals and priorities. The following section is based closely on Grunwell's (1992) chapter entitled "Principled decision making in the remediation of children with phonological disorders." Grunwell's (1992) chapter follows the framework below:

- Clinical characteristics of client group
- Basis for decision making
- Remediation
- Decision-making principles for treatment planning.

Clinical characteristics of client group

The BSAE-speaking client group under discussion is characterised by frequent client dissatisfaction with BSAE speech which differs from StdSAE at either the functional level or the aesthetic level, or both. This client group has normal hearing, a lack of speech and language pathology and normal intellectual, anatomical and neurological development.

Basis for decision making

The basis upon which decisions in treatment planning are made is a phonological assessment and it is essential that the evaluation reveal the accent characteristics and / or intelligibility difficulties. The case history interview should aim to determine the type of level(s) that assessment and remediation should target. The assessment framework should be relatable to a treatment framework. At the functional level, assessment might utilise a similar task to the one in this study. BSAE clients read a wordlist such as the one in the study (Appendix 3) to StdSAE listeners in a highly constrained environment, to determine where difficulties occur. Tape-recording of this reading would be further useful for the speech and language therapist to detect aesthetic differences which are present but do not affect meaning. The individual subject profiles (based on Stoel-Gammon and Herrington, 1990) used in this study may form a useful way of analysing client speech.

The phonological evaluation of this assessment poses the following questions:

- are the BSAE speaker's pronunciation patterns as would be expected, or not? (based on, for example, Table 19).
- If some patterns are idiosyncratic, specify these and determine any possible causes and consistency of use.
- Where there are differences, what are the implications for the individual's ability to signal meaning differences? (adapted from Grunwell, 1992).

The answers given to these questions provide the information for planning the treatment programme. The framework for treatment derives from the same concepts as the framework for assessment. It is essential to identify precisely the communicative inadequacies in the BSAE speaker's phonological patterns.

The results presented in Table 19 aim to provide guidelines to aid with the development of assessment procedures, therapy rationales and therapy aims for work with BSAE-speaking clients. Not all features will be evident in the speech of each BSAE client, and the therapist will need to carefully select the applicable aspects to be addressed, once the broad level of need has been determined.

Remediation

The purpose of speech therapy intervention is to bring about change in pronunciation patterns. It is suggested that the creation of phonological knowledge for the L2 speaker is affected by restricted perceptual encoding potential which may lead to a failure to store adequately less familiar phonetic elements (Grunwell, 1992). Therapy would thus focus on exposing the L2 speaker to these elements and making them explicitly aware of the phonological and articulatory features which characterise them in an L1. Accurate perception of L2 sounds is a basic tenet of Flege's Speech Learning Model (1991) which aims to account for age-related limits on the ability to produce L2 vowels and consonants in a native-like fashion (1995). The model claims that without accurate targets to guide the sensorimotor learning of L2 sounds, production of L2 sounds will be inaccurate. It may be beneficial to first train BSAE speakers to accurately perceive sounds in the L1.

Each individual will present with a unique profile and requires an individual programme. Approaches should therefore be individualised with strategies specifically designed to assist the individual to overcome or compensate for particular constraints.

Decision Making Principles for Treatment Planning

1. Variability should be targeted in order to establish stable and accurate realisations.
2. The system of contrasts should be expanded to increase communicative adequacy.
3. New contrasts should be introduced first in well-established structures.
4. The phonotactic potential should be extended to increase communicative adequacy.
5. The patterns that should be targeted first are those that are most destructive of communicative adequacy in regard to the speaker's linguistic abilities. (Grunwell, 1992).

Methodological Issues and Suggestions for Further Research

1. The present study used a limited number of BSAE subjects and results must be interpreted with an awareness that the hypotheses generated are tentative and that they have yet to be proven using a more quantitative research paradigm.

2. More research will be required to determine which phonological features accompany basilectal, acrolectal and mesolectal varieties of BSAE. Little attempt was made in the present study to categorise dialects, although the study aimed to involve members of the emerging black middle classes who most likely spoke in dialects aproximating the mesolect.
3. Van Rooy (1995) suggests that when subjects are required to do a single word task, they read much more carefully than they would normally because they realise that their speech is the focus of the experimental task. This is something which was not specifically taken into account in the present study. However, there was an awareness that subjects may have read more carefully than they would normally speak, but at the same time that listeners would normally have had a greater variety of contextual and situational cues at their disposal. Given the potentially complicating issues of cross-cultural communication and the variety of acquisitional contexts for English in South Africa, we may ask how any degree of successful communication could be possible. Cameron and Williams (1997) are concerned with determining how a tolerable degree of mutual understanding is achieved in the face of limited linguistic resources. They suggest that research into nonnative speaker and native speaker communication has yet to provide a comprehensive and theoretically-grounded answer to this question. They examine the difficulties faced, the success and lack thereof in coping with these difficulties and the strategies used in doing so. "The clearest instances of a lack of communicative breakdowns where they might be expected, but in fact do not emerge, revolve around the non-native speakers problematic pronunciation..." (p.423). They suggest that in the real-time situation this is overcome by inference. Future research might examine the effects of these variables.
4. In the present research, the speech of Xhosa L1 speakers only was studied. Future research might focus more specifically on subjects from different regions who have different mother tongues.

CONCLUSIONS

There is a need for speech and language therapists in South Africa today to make their services useful and relevant to a vast multilingual population. This awareness is important in determining whether difficulties experienced by such speakers are pathological or due to linguistic or cultural differences. Making such a distinction is vitally important. This project developed from an interest in addressing the more specific needs of bilingual speakers who form part of a large, emerging middle class in a developing country.

Many speech and language therapists may hesitate to become involved in an area which has traditionally been the domain of corporate communication trainers or 'TESOL' teachers. This paper suggests a broad clinical-type framework for therapists to use in this area, and to show that concepts such as distinctive features and phonological processes can be applied to this client group. Tools such as the wordlist developed in the present study, the methodology used, Stoel-Gammon and Herrington's (1990) individual subject profiles, and the category guidelines presented in Table 19, are all readily applicable to daily clinical work.

The categorisation of BSAE phonological features at a segmental level, into functional and aesthetic levels, is the major contribution of the study. Further research will be required to determine the accuracy and appropriacy of the categorisation. It is hoped that this study will stimulate and encourage the involvement of more speech and language therapists in meeting the needs of BSAE speaking individuals and their 'right to language'.

Appendix 1. Questionnaire used in subject selection procedure.

Name:_____
Date of birth:_____ Place of birth:_____

A. CHILDHOOD AND EDUCATION
Mother's occupation: _____
Father's occupation: _____

Mother's languages (please name all languages and the degree of competency, if known)
_____
_____
_____
_____

Father's languages (please name all languages and the degree of competency, if known:
_____
_____
_____
_____

Please name areas of the country where significant parts of your childhood were spent:
_____
_____
_____
_____

What were the main languages spoken in your childhood home?
_____
_____
_____

What language was the medium of instruction at your school?
Junior school:_____
_____
_____

Senior school:_____
_____
_____
_____

Were you exposed to any other languages at school and in what capacity?
_____
_____
_____
_____
_____

At what age and grade level did you leave school?
_____
_____

When you left school, what languages could you speak, read and write?

Language No.1. _____
(*circle the appropriate response*)

Spoke a) fluently – as main language
b) fairly well but limited to certain contexts
c) poorly – but with a knowledge of fundamentals

Wrote a) well
b) fairly well but with some slowness and errors
c) poorly
d) not at all

Read a) well
b) fairly well but with some slowness and errors
c) poorly
d) not at all

Language No. 2. _____
(*circle the appropriate response*)

Spoke a) fluently – as main language
b) fairly well but limited to certain contexts
c) poorly – but with a knowledge of fundamentals

Wrote a) well
b) fairly well but with some slowness and errors
c) poorly
d) not at all

Read a) well
b) fairly well but with some slowness and errors
c) poorly
d) not at all

Language No. 3. _____
(*circle the appropriate response*)

Spoke a) fluently – as main language
b) fairly well but limited to certain contexts
c) poorly – but with a knowledge of fundamentals

Wrote a) well
b) fairly well but with some slowness and errors
c) poorly
d) not at all

Read a) well
b) fairly well but with some slowness and errors
c) poorly
d) not at all

Language No. 4._____
(*circle the appropriate response*)

Spoke a) fluently – as main language
b) fairly well but limited to certain contexts
c) poorly – but with a knowledge of fundamentals

Wrote a) well
b) fairly well but with some slowness and errors
c) poorly
d) not at all

Read a) well
b) fairly well but with some slowness and errors
c) poorly
d) not at all

Language No.5._____
(*circle the appropriate response*)

Spoke a) fluently – as main language
b) fairly well but limited to certain contexts
c) poorly – but with a knowledge of fundamentals

Wrote a) well
b) fairly well but with some slowness and errors
c) poorly
d) not at all

Read a) well
b) fairly well but with some slowness and errors
c) poorly
d) not at all

B. PRESENT EMPLOYMENT / STUDIES

Please provide a brief outline of your employment and/or tertiary study history since leaving school. Please provide details of any significant language exposure or patterns of language use.

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

Please provide brief details of the type of work / studies which you currently do.

How long have you been involved in this area of work / studying? What are your future plans?

Which languages do you use in your work / study environment? Please provide details as necessary e.g. talk to colleagues in *x* language; deal with business queries in *y* language.

C. SOCIAL AND PERSONAL COMMUNICATION

With whom do you live and what languages do you use for communication in the home?

On a night-out with your closest friends, which language would you be most likely to use? _____

In general, what is your preferred language?

With which language do you -- or would you like - to be most closely identified?

Appendix 2. Biographical and Sociolinguistic Information Pertaining to StdSAE Subjects.

Biographical information relevant to each StdSAE subject.

Subj.	Age	Sex	Occupation	Duration	Place of Birth
1	25	F	Medical Technologist	4 years post-qualification	Johannesburg
2	34	F	Typist	10 years	Worcester, Western Cape
3	51	M	Consultant Physician	approx. 20 years	Welkom, Free State
4	34	M	Medical Registrar	9 years post-qualification	Durban
5	38	M	Medical Technologist	14 years post-qualification	Johannesburg
6	39	M	Social Worker	approx. 15 years	Port Elizabeth
7	26	F	Medical Technology Student	2 years	Cape Town
8	40	F	Secretary	20 years	Cape Town
9	32	F	Secretary	approx. 10 years	Johannesburg
10	41	F	Clinical Co-ordinator	17 years post-qualification	Cape Town
11	38	F	Nursing Sister	15 years	East London
12	43	F	Nursing Sister	17 years	Durban

Patterns of language exposure relevant to each StdSAE subject.

Subj.	L1	L2	Other	Mother's L1	Father's L1	Mother's L2	Father's L2	Other language at home	Medium at school
1	English	Afrikaans	nil	Afrikaans	English	English	Afrikaans	nil	English
2	English	Afrikaans	nil	English	Afrikaans	English	Afrikaans	nil	English
3	English	Afrikaans	nil	English	English	Afrikaans	Afrikaans	nil	English
4	English	Afrikaans	Hebrew	English	English	Afrikaans	Afrikaans	nil	English
5	English	Afrikaans	nil	English	English	Afrikaans	Afrikaans	nil	English
6	English	Afrikaans	nil	English	English	Afrikaans	Afrikaans	nil	English
7	English	Afrikaans	nil	English	English	Afrikaans	Afrikaans	nil	English
8	English	Afrikaans	German (limited)	English	English	Afrikaans	Afrikaans	nil	English
9	English	Afrikaans	nil	English	Afrikaans	Afrikaans	English	nil	English
10	English	Afrikaans	nil	English	Afrikaans	English	Afrikaans	nil	English
11	English	Afrikaans	nil	English	Afrikaans	English	Afrikaans	nil	English
12	English	Afrikaans	nil	English	n/a	Afrikaans	n/a	nil	English

Patterns of language use relevant to each BSAE subject.

Subj.	Language(s) used at home	Language(s) for socialising	Preferred language	Language(s) in the workplace
1	English	English	English	English
2	English	English	English	English
3	English	English	English	English
4	English	English	English	English
5	English	English	English	English
6	English	English	English	English
7	English	English	English	English
8	English	English	English	English
9	English	English	English	English
10	English	English	English	English
11	English	English	English	English
12	English	English	English	English

Appendix 3. Master List of Stimulus Words

1. abode
2. bed
3. beer
4. beg
5. bird
6. book
7. boy
8. cane
9. cars
10. chair
11. court
12. cut
13. dark
14. dog
15. duck
16. each
17. fate
18. fern
19. five
20. food
21. for
22. germ
23. get
24. goat
25. god
26. hair
27. heart
28. here
29. hurt
30. hut
31. job
32. knife
33. lane
34. late
35. leaps
36. mouth
37. my
38. oil
39. poor
40. put
41. rang
42. reach
43. rich
44. roam
45. rude
46. sad
47. sat
48. seat
49. seed
50. sheep
51. shoe
52. sip
53. sit
54. sleep
55. slip
56. spoon
57. sure
58. swimmer
59. these
60. thinks
61. this
62. three
63. town
64. vest
65. wash
66. watch
67. wed
68. word
69. worst
70. yearn
71. yes
72. zip

Appendix 4. Instructions to subjects

Instructions to BSAE Readers

This is a list of common English words which you are going to read out aloud to two other volunteers. Each volunteer is going to write down the words you say, so read the words slowly giving him/her time to write the word down. Please follow the list and read each word only once in your normal speaking voice. At the end of each block of words, pause for about 5 or 10 seconds to give the writer a rest. Many of the words on the list will occur more than once, and this is correct. When you reach the blue line, please stop reading as this is the end of the first part of the list. The first writer will leave the room and another volunteer will take his/her place. We will then continue with the second part of the list in the same way, until the red line is reached.

Instructions to StdSAE Listeners

Volunteer X (the BSAE subject) has a list of common English words and is going to read these out to you. Listen carefully and after each one, please write down the word you heard, in the space provided on the answer sheet. Volunteer X has been instructed to read each word only once, and will not repeat words. If you are unsure what the word is please do not leave the space blank but take a guess based on what you heard. Many of the words will occur more than once, and this is correct. Please write clearly. Do not write more than one word per line. As you can see the words are grouped into batches of 10, and at the end of each of these X will pause for a couple of seconds. Please let me know if a word has been omitted. Please stop X if s/he is reading too fast or should you require a break.

Appendix 5. Vowel and dipthong errors.

S1

Target	*Realisation*
abode	aboard
bed	bag
bird	bed
court	cold
dark	duck
fern	fan
germ	jam
get	goat
hut	heart
leaps	this
oil	all, oil
rang	drink
reach	rich
sad	said, sit
sat	said
seat	sit
seed	sit, said
sip	sleep
slip	sleep
sure	shawl
these	this
thinks	thanks
wed	word
word	white
worst	waste
yes	hers

S2

Target	*Realisation*
abode	boat
beer	bear
bird	bed
court	cot
cut	cat
dark	dog
fern	f__
germ	gym
get	good
hair	hear
heart	hat, hand
hurt	hat
hut	hat
leaps	lips
rang	run
reach	rich
rude	road
sad	said
sat	sit
seat	sit

seed	sit
sip	sleep
slip	sleep
sure	show
these	this
wed	wait
word	wart
worst	west
yearn	hear

S3

Target	***Realisation***
abode	aboard
bed	bad
duck	dark
fern	*omitted*
germ	jam
hair	her
heart	hot
hut	head, heart
leaps	lips
reach	rich
sad	said
sat	set
seat	sit
seed	*omitted*
sheep	ship
wed	word
yearn	your

S4

Target	***Realisation***
bed	bad
beg	bag
bird	bed
cut	cart
duck	dark
each	itch
fern	fell
germ	jam
hair	hand
leaps	lips
reach	rich
sad	said
sat	sit, said
seat	sit
slip	sleep
sure	show
wed	word

S5

Target	***Realisation***
abode	about

bed	bird
beg	bag
bird	bed
chair	chirp
duck	dark
fern	fail
for	fog
germ	jam
heart	hat
hurt	hat
hut	hat
job	robe
leaps	lips
rang	rain
rich	reach
sad	said, send
sat	sit
seat	sit
sheep	ship
slip	sleep
sure	shoe
vest	waist
wed	word

S6

Target	***Realisation***
abode	boat
beg	bag
bird	bed
court	cot
dark	duck
fern	fan
germ	jam, gym
hair	hay
heart	hut
hurt	hat
reach	rich
roam	room
sad	sit
sat	sit
seat	sit
seed	sit
sure	*omitted*
these	is
yearn	hear

S7

Target	***Realisation***
abode	aboard
bed	bad
beg	bag, back
bird	bad, bed
court	cot

dark	duck
each	itch
fern	fan
germ	jam
get	gate
heart	hut
hurt	hut
leaps	lips
reach	rich
roam	room, broom
seat	sit
seed	sit
sheep	ship
slip	sleep
town	dumb
wed	ward
word	ward
worst	west
yearn	yen

S8

Target	***Realisation***
abode	aboard
beg	bear
bird	bed
chair	child
court	cot
duck	dark
fern	form
germ	jam
get	good, goat
heart	hut
hurt	hut
lane	lean
leaps	lips
put	boot
rang	ring
reach	rich
roam	room
sad	sit, said
sat	sit
seat	sit
seed	sit
sit	set
slip	sleep
worst	waste
yes	hears

S9

Target	***Realisation***
abode	abort
court	cot
dark	duck

duck	dark
fern	for
for	font
germ	chair
goat	wood
heart	hut
hurt	hot
hut	heart
lane	line
leaps	lips
rang	rage
reach	rich
roam	room
sad	send
sat	sit
seat	sit
seed	send
these	those
wed	wind
word	wet
worst	waste
yearn	yen, hen

S10

Target	***Realisation***
abode	aboard
cars	curse, hers
court	cot
dark	dog
duck	dog
fate	fight
god	old
hurt	hut
hut	heart
leaps	lips, licks
reach	rich
sad	said
seat	sip
seed	sit
sheep	ship
these	raise
wed	word
worst	west

Appendix 6. Consonantal Errors

S1

Target	*Realisation*
court	cold
hurt	heard
leaps	this, leaves
rang	drink
sad	sit
sat	said
seat	sit
seed	sit
these	this
watch	wash
yes	hers

S2

Target	*Realisation*
abode	boat
book	hook
dark	dog
get	good
heart	hand
rang	run
seed	sit
sip	sleep
these	this
thinks	things
three	tree
watch	wash
wed	wait
word	wart
yearn	hear

S3

Target	*Realisation*
beer	here
bird	herd
hut	head
lane	lay
roam	row
worst	worse
yearn	your

S4

Target	*Realisation*
fate	faith, fade
fern	fell
goat	boat
hair	hand
heart	hard
roam	roll
sat	said
these	diz

town	down

S5

Target	***Realisation***
abode	about
chair	chirp
fate	paint
fern	fail
for	fog
job	robe
rang	rain
sad	send
town	towel
vest	waist

S6

Target	***Realisation***
abode	boat
bed	bent
cane	came
fate	fade
five	fight
for	fall
leaps	leaves
rang	ran
rude	root
sad	sit
seed	sit
sip	sick
sure	*omitted*
these	is
thinks	things
this	list
three	tree
yearn	hear

S7

Target	***Realisation***
beg	back
job	jaw
rang	ran
roam	broom
seed	sit
town	dumb

S8

Target	***Realisation***
bed	dead
beg	bear
cane	came
fate	faith
fern	form
get	good

hair	air
put	boot
rude	root
sad	sit
seed	sit
shoe	school
thinks	things
town	down
wed	wet
yearn	earn
yes	hears

S9

Target	***Realisation***
bed	head
cane	came
fate	faint
fern	four
for	font
germ	chair
goat	wood
rang	rage
sip	zip
thinks	things
wash	watch
wed	wind
word	wet
yearn	hen

S10

Target	***Realisation***
book	hook
cane	game
cars	curse, hers
dark	dog
duck	dog
fern	burn
five	buy
god	old
job	jaw
knife	life, night
leaps	licks
roam	home
seat	sip
seed	sit
sip	zip
these	raise
this	wrists
three	free
watch	wash

Appendix 7. Most prominent* phonological processes used by each subject

Subject	Processes	Example
S1	Word final devoicing+	/sit/ [sad]
	Word final voicing	/heard/ [hurt]
	Epenthesis (/l/ insertion)	/sleep/ [sip]
S2	Word final devoicing	/sit/ [seed]
	Word final voicing	/dog/ [duck]
	Glottal substitution	/hook/ [book]
S3	Final consonant deletion	/lay/ [lane]
	Glottal substitution	/here/ [beer]
S4	Word final voicing	/fade/ [fate]
S5	Liquid substitution	/towel/ [town]
S6	Word final devoicing	/root/ [rude]
	Stopping of fricatives	/fight/ [five]
	Liquid substitution	/list/ [this]
	Epenthesis (/n/ insertion)	/faint/ [fate]
S7	Word final devoicing	/sit/ [seed]
	Final consonant deletion	/jaw/ [job]
S8	Word final devoicing	/root/ [rude]
	Word final voicing	/good/ [get]
	Initial consonant deletion	/hair/ [air]
S9	Word final voicing	/wood/ [goat]
	Epenthesis (/n/ insertion)	/faint/ [fade]
	Final consonant deletion	/four/ [fern]
	Glottal substitution	/head/ [bed]
S10	Liquid substitution	/wrists/ [this]
	Glottal substitution	/hook/ [book]
	Word final devoicing	/sit/ [seed]
	Stopping of fricatives	/buy' [five]

* For each subject the 3 most common processes were listed. Where two processes were used an equal number of times, both were listed. Only processes used more than once were included.
+ Most prominent processes listed first.

Appendix 8. Distinctive Feature Analysis

% incorrect realisation of features										
	SUBJECT									
Feature	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10
+ vocalic	5	0	0	0	0	0	0	0	0	0
- vocalic	0	0	0	1	2	0	0	0	0	1
+ consonantal	0	0	1	0	0	0	0	0	0	1
- consonantal	0	0	0	0	0	0	0	0	0	0
+ high	2	4	0	2	4	4	4	2	2	2
- high	0	0	0	0	1	1	0	0	0	1
+ back	0	3	0	3	3	3	3	0	3	3
- back	0	0	0	0	0	0	0	0	0	0
+ low	0	0	0	0	0	0	0	0	0	0
- low	0	1	1	0	0	0	0	0	1	1
+ anterior	0	1	1	0	1	1	0	0	1	2
- anterior	0	1	0	1	1	1	1	0	0	0
+ coronal	0	0	0	0	0	1	1	1	1	3
- coronal	0	1	0	1	1	1	1	2	1	1
+ voice	4	6	2	0	0	6	3	4	4	3
- voice	3	3	1	3	0	2	1	3	2	3
+ continuant	0	2	0	1	1	3	0	0	2	3
- continuant	1	1	1	2	2	1	0	1	1	3
+ nasal	0	0	0	9	9	0	0	0	4	4
- nasal	0	0	0	0	0	0	0	0	0	0
+ strident	0	0	0	0	5	2	0	0	0	5
- strident	1	0	0	0	0	1	0	0	1	1
+ sonorant	2	0	0	0	0	0	0	0	2	0
- sonorant	0	1	1	0	1	1	0	0	1	2

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