

**AUDIO-PSYCHO-PHONOLOGY AS AN AIM TO IMPROVE
THE PRONUNCIATION OF THE ENGLISH OF ZULU-
SPEAKERS: AN EVALUATION**

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Nye yenzela ubaba wam

Abstract

This study investigates the impact of Audio-psycho-phonology (APP), a process of hearing stimulation by means of a device called the Electronic Ear, as an aid to second language (L2) pronunciation training. The outcomes of APP and traditional pronunciation training on the vowel perception L1 Zulu-speakers who use English as a business language were explored. This group was chosen because intelligible pronunciation is important in their designations. Perception of English vowels was isolated as a base for testing. Pre- and post testing of vowel perception indicates that APP did not have a significant impact as an aid to pronunciation training. A post hoc attitude assessment, conducted amongst the business community, yielded interesting results regarding the connection between pronunciation and language attitudes.

Keywords: Tomatis, Audio-psycho-phonology, second language pronunciation, pronunciation training, Zulu-speakers

Opsomming

Die fokus van hierdie studie was om die impak van Oudio-psigo-fonologie (OPF), die proses van gehoorstimulasie deur middel van die Elektroniese Oor toestel, as 'n hulpmiddel tot tweede taal (T2) uitspraak te ondersoek. Die uitkoms van OPF en tradisionele uitspraakopleiding op die vokaal-persepsie van 'n groep T1 Zulusprekende individue wat Engels as 'n besigheidstaal gebruik, is verken. Hierdie groep is verkies weens die belangrike rol van verstaanbare uitspraak in hulle werksmilieu. Die isolering van persepsie van Engelse vokale het as die basis vir toetsing gedien. Deur voor- en natoetsing van vokale persepsies, is die gevolgtrekking geformuleer dat OPF, as 'n hulpmiddel in uitspraakopleiding, nie 'n merkbare impak gehad het nie. Aanvullend het 'n post-hoc beraming van 'n wyer besigsheidsgemeenskap, interessante bevindinge met betrekking tot hierdie gemeenskap se houding van taal teenoor uitspraak opgelewer.

Sleuteltermes: Tomatis, Oudio-psigo-fonologie, tweede taal uitspraak, uitspraakopleiding, Zoeloe-sprekers

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Abstract

This study investigates the impact of Audio-psycho-phonology (APP), a process of hearing stimulation by means of a device called the Electronic Ear, as an aid to second language (L2) pronunciation training. The outcomes of APP and traditional pronunciation training on the vowel perception L1 Zulu-speakers who use English as a business language was explored. This group was chosen because intelligible pronunciation is important in their designations. Perception of English vowels was isolated as a base for testing. Pre- and post testing of vowel perception indicates that APP did not have a significant impact as an aid to pronunciation training. A post hoc attitude assessment, conducted amongst the business community, yielded interesting results regarding the connection between pronunciation and language attitudes.

1. INTRODUCTION

The political developments in South Africa in the mid-nineties brought about many changes, one of which is the embracing of English as *Lingua Franca* for business and commerce. South African trade and industry have been integrated into the international arena, which implies the exchange of ideas on an international scale (Jenkins, 1991:94). This, coupled with the power that English speaking nations have in the business arena, creates a new reality – English seems to have gained increasing acceptance as a *Lingua Franca* despite the fact that Zulu, Xhosa and Afrikaans are the home languages of a far larger percentage of the population (Extra & Maartens, 1998:9).

This does, however, create challenges for second-language speakers who wish to use the language intelligibly and expressively. In 1978 Lanham and Prinsloo

(1978:190 –191) described the impact that separate development has had on the teaching of English in black schools. Jacobs' (1992:16-24) investigation confirms that years of separation have left its mark on the English taught in traditionally black schools. The result is that presently many different varieties of South African English are used. This is specifically prevalent in business and industry where South Africans from all language backgrounds interact with each other and internationally. Therefore being able to use the language competently and intelligibly is seen by many as a status symbol (Theron: 1993:80). In fact, it has almost become a necessity for getting employment, as found in an informal survey conducted among three of Gauteng's recruitment agencies at the commencement of this study. When recruitment agents were asked if they consider an applicant's ability to speak English when filling positions, all agreed that it is an important consideration. The workplace section of the Star Newspaper (October 11, 2000) boasts many advertisements seeking front-line personnel, and lists the following requirements: "*well spoken*", "*fully bilingual*", "*good command of English essential*" and "*excellent Communication skills, English essential*". Although these adjectives are vague, it could be seen as a reflection of the importance placed on spoken competence in English. In order to develop the spoken English of L2 users many corporate training programmes have been initiated, and the importance of verbal communication has ensured that pronunciation training forms an integral part of such programmes. The objective of such programmes is to optimise the intelligibility of L2 users' spoken English in business communication. Accurate pronunciation is therefore pursued rather than accent reduction.

It is against this background that APP was investigated as an appropriate method to improve the English pronunciation of L2 users.

1.1 Audio-psycho-phonology and traditional language and pronunciation training programmes.

Audio-Psycho-Phonology (APP) could be described as a study of the interplay between an individual's listening hearing potential (Audio), his/her psychological attitudes (Psycho) and his/her control of speech and language (Phonology) (Van Jaarsveld, 1975:1). This method was developed by Alfred A Tomatis and is used in the fields of Psychology, Music Education, Remediation of Learning problems and Language Teaching. The theory behind APP could be summarized by means of the three Tomatis Laws:

- *"The voice contains only what the ear hears" or "The larynx emits only the harmonics that the ear can hear"*
- *"If a defective ear is given the capacity of hearing lost or impaired frequencies correctly, these are instantly and unconsciously restored to vocal emission"*
- *"Auditory stimulation maintained for a determined period modifies, by the retention phenomenon, the self-listening faculty of the subject and consequently his phonation"* (Tomatis, 1975 ; Tomatis, 1978 ; Tomatis, 1991 ; Tomatis, 1996).

In essence Tomatis claims that sounds which are not perceived correctly cannot be produced correctly, unless hearing/ perception is corrected. If the "correct" hearing/perception continues for a period it would lead to successful carry-over. This is achieved by means of a device called the Electronic Ear, which simulates an optimally functioning human ear, by modifying sound so that it is boosted in the higher frequency range. This forces the auditory faculty from passive accommodation into active participation by means of osteo-muscular activity that enables active listening. Tomatis' final model of the Electronic Ear made auditory self-conditioning possible by means of acquired reflexotherapy (Van Jaarsveld, 1969:2). Experimentation with auditory stimulation led him to a further assumption, namely that the right ear is the leading ear in the process of phonation, due to the right ear's direct neurological connection to the center for language abilities in the left temporal lobe of the brain (Tomatis, 1978:8; Gerritsen, 1996:4). Tomatis

directed his experience of the ear-voice relationship to the learning of foreign languages and attempted to determine the spectrum receptivity of different language users. Recordings were collected and he discovered what he terms an envelope curve for each ethnic group, based on the average recorded values of all the frequency peaks found in a specific language (Tomatis, 1987:72). Examples of preferential frequency bands, as measured by Tomatis are - French between 1,000 and 2,000 Hertz and British English between 2,000 and 12,000 Hertz¹. Finally, Tomatis claims that L2 learning can be accelerated and pronunciation improved by adjusting the Electronic Ear to the frequency of the target language to sensitize the subject(s) to the prominent frequencies (Tomatis, 1987:77). He states this sensitizes the learner to frequencies that are under-used (Tomatis, 1987:72).

The perception and production of new or unfamiliar sounds is a common objective of various approaches to pronunciation training. As Chela de Rodrigues states (1991: 356) if a student is unable to perceive a phonetic aspect he/she seems to be unable to produce it in the spoken form. It could be described as a listener's "decoding" of the impute speech signals by using their knowledge of the constraints that are imposed by the human articulatory output apparatus. This causes the L2 speaker to subject the phonemes produced in L2 to the phonetic rules of L1 that could lead to unintelligibility in the pronunciation of L2 (Henry 1994:62 ; Gleaser, 1995:22 ; Haasbroek & van Wyk 1996: 164 -165). Fledge (1978:9) also explores phonetic interference and distinguishes between "identical", "new" and "similar" phones in the articulation of L2 speakers. "New" phones could be described as sounds that have no counterpart in the speakers L1. "Similar" phones are sounds in L2 that differ systematically from easily identifiable

¹ No documentation on how Tomatis determined the *envelope curves* of languages could be obtained. Paul Madaule provided the only possible explanation in a letter to the researcher. His approximation is as follows: (a) A list of phonemes of the target language should be obtained, (b) The frequency content of these phonemes should be calculated, (c) The ensemble of the frequency content of all the phonemes should provide the

counterparts in L1.

Although Tomatis uses the term “hearing” instead of perception and describes L1 interference in very broad terms his core theory seems to resemble the above. APP claims to offer a unique approach to develop the perception of L2 sounds and promises to achieve results within a shorter duration, which seems an attractive option when dealing with members the business community (Gerritsen, 1996:4).

APP also has the characteristic of stimulation through listening which promises a non-invasive approach contrary to traditional pronunciation training which relies on *analyzing* and drilling of the phonetic, syntactical and morphological structures of a target language (Blaquiere, 1985:1). Tomatis is adamant that sound stimulation through the Electronic Ear cannot be seen as a substitute for the teaching of a foreign language. It could therefore be viewed as a non-invasive *complement* to pronunciation and language training programmes.

Pronunciation training assumes an important position in *traditional* language training programmes and is also taught on the basis of theory, form and structure (Wong, 1989: 1). This includes formal instruction in phonetics/ phonology with prescribed accuracy as objective. Practical instruction uses repetition of “correct pronunciation”, theoretical description of the production of sounds, linking of pronunciation with spelling and examination of minimal pairs This approach promotes accurate production at segmental level (Wong, 1989:2).

This *traditional* approach has made way for an approach that favours an integrated communicative emphasis on larger parts of speech instead of isolated drills (Chun, 1991:179 ; Hocking, 1964:24). The communicative approach to language and pronunciation training has introduced many aids and activities such as pictures, story telling and songs to activate communication in the target language. The

recordings used in modern language laboratories have also been adjusted, to provide an appropriate model as complement to communicative classroom instruction (Hocking, 1964:24). Visual stimuli are added to modern language laboratories by means of audio-video equipment and computer based pronunciation training to accelerate learning (Otto, 1989:286). The latter has the added function of speech-synthesis that allows students to hear authentic English and their own attempts to facilitate self-monitoring skills (Amos, 1988:58 ; Otto,1989:279 ; Frommer, 1989:335 ; Haasbroek & van Wyk, 1996:180). Other approaches towards L2 language and pronunciation training include the silent way which encourages students to use their own cognition to discover sounds, without prompting, and aided by colour and gesture (Larsen-Freeman, 1986:51). Immersion programmes which imply that a student is literally immersed in daily activities conducted in the target language, has the potential to provide holistic acquisition. Although it could also ensure indirect models, its main disadvantage is the lack of systematic instruction (Hammerly, 1987:28).

When one deals with students such as L2 speaking professionals who use business English daily, the outcome stretches further than activating communication. To promote intelligible and expressive communication, refinement of pronunciation should be achieved. This is one of the reasons why APP was chosen for this study as a possible complement to pronunciation training.

The impact of APP on the pronunciation of L2 speakers in the South African context has, to the knowledge of this researcher, never been tested. At first glance it seems to offer many of the components provided by other methods:

- Audio-lingual stimulation
- Appropriate models are provided
- Recordings and material that can be adapted to the needs of students
- Recordings can be structured to develop pronunciation at a segmental level therefore address specific areas of L1 interference

- Active listening would also expose students to larger parts of speech and connected speech in the target language
- APP claims to promote self-monitoring skills
- Improved perception of the phonemes of the target language is prescribed.

The most visible difference between APP and traditional training is the method. Tomatis' theory of sound filtered to the *envelope curve* of the target language to improve perception and production of L2 provides a potentially unique *complement* to L2 pronunciation training.

1.2 Pronunciation training for Zulu-speakers

To explore the impact of APP as an effective and appropriate approach towards improving the pronunciation of L2 speakers, its impact on a group of Zulu-speaking front-line personnel was tested in this study. Zulu speakers were chosen because it constitutes the first language of the largest percentage of South Africans (23%). This is also representative of Gauteng where the study was conducted and where 21,5% of the population are L1 Zulu speakers (census 1996).

To investigate the impact that APP would have on the pronunciation of L1 Zulu-speakers it is important to explore how phonological structures are rendered by L1 Zulu-speakers when they use English. Lanham (1978:192) identified four main points of native language interference in speakers of BSAE,² which includes Zulu. Three of these points are based on perception and production of vowel sounds. Although not the only source of interference, vowel perception was examined in this study to explore its role in pronunciation training for adults and as a means of measuring the results of such training. Existing literature (Roux, 1979 ; Roux

² BSAE or Black South African English is referred to as a generic term to describe a variety of English used by speakers whose first languages are Bantu languages (Smit &

1994; Taljaart & Bosch, 1988 ; Canocici, 1996 ; Roach, 1991 ; Spencer, 1996 ; Adendorf & Salvini-Beck, 1993) was used to compare the vowel-systems of English and Zulu and the following core conclusions were made, focussing on the general area of articulation:

a) *The English vowel system is bigger than the Zulu vowel system. English has 12 primary vowels compared to 7 in Zulu. This in itself presents opportunity for error as Zulu speakers may produce English vowels according to their own limited vowel system. For example a Zulu speaker may render all sounds spelled with the letter /a/ as an / Δ / sound because of the absence of varieties in his own vowel-system. The / α :/ in / α :ft θ / will therefore be replaced by an / Δ / because this is a known sound in the speaker's vowel system.*

b) *The English vowels are spread and manifest in clusters where Zulu often has only one sound. Examples are the / α :/, / \ae /, / e I/ and / Δ / cluster. This too may cause difficulty for Zulu-speakers to produce English sounds, as they will render the sounds in these clusters according to their limited vowel system.*

c) *Unlike the / \int :/ and / θ / true mid vowels in English, Zulu contains front and back mid-high and mid-low vowels. The mid-high vowels in the Zulu vowel-system are allophonic variants of the mid-low vowels. This may cause Zulu speakers to substitute English central vowels with sounds in their own vowel system. For example the / \int :/ in 'work' / $w\int$:k/ will be replaced by the / e :/ or / e / that the closest substitutes for the central vowels, resulting in the pronunciation / wek /.*

d) *Zulu has no diphthongs.*

e) *The final difference between the two vowel systems is the characteristic of length. Certain English vowels have inherently longer articulations and other inherently short articulations. These sounds are articulated in much the same place and the difference in length is unaffected, in context, by other sounds. The difference in length does often*

affect meaning.

E.g. the sounds /ɪ/ and /iː/ in 'fill' and 'feel'

Zulu has no such pairs of sounds that are close in articulation but different in length. Vowel length does occur in Zulu but has no impact on meaning. In fact, any vowel may be lengthened in Zulu when it occurs in the penultimate syllable of a sentence to indicate that the end of the sentence is immanent. Vowels may also be lengthened to indicate a remote past tense form of a verb.

E.g. **Babona inko:si** /they see the chief/

Ba: bona inko:si /they saw the chief/

These are, however, discourse functions and do not affect meaning. It could be stated that the absence of vowel lengthening that affect meaning may result is Zulu speakers applying the same length to all the English vowels as they do in their own language.

The above comparison correlates with three of Lanham's (1978:192) four points of interference. This information was utilized in measuring the efficiency of APP on Zulu-speakers' English pronunciation in this study.

2. AIMS

The following objectives were pursued in this study:

- To compare the impact of pronunciation programmes that utilises APP and traditional methods, on L1 Zulu-speakers' perception of English vowels.
- To compare the impact of an APP aided programme, versus a programme that uses traditional method only, on the intelligibility and overall impression of L1 Zulu-speakers by means of an attitude assessment amongst the business community.

3. METHOD

3.1 General design

A two group, pre–post-assessment design was used consisting of four participants each. An experimental group participated in 30 hours of APP training at the Institute for Psychotherapy and Counseling at Potchefstroom University, as well as a traditional training programme, conducted by Voice Excellence, Johannesburg. A control group participated in the traditional training programme with Voice Excellence only. Both groups participated in perception tests prior to training programmes and after completion. After completing the training programmes, the subjects were recorded, reading a short text. These recordings were played to members of the business community, who completed a criteria-sheet to assess the attitude projected.³

3.2 Participants

The main criteria used to select participants were:

- (i) Zulu–speaking adults who
- (ii) received their schooling primarily in Zulu and
- (iii) who use spoken English in their jobs; and
- (iv) are employed in an environment where verbal interaction in English occurs frequently, both face to face and telephonically.

Delegates were drafted by means of an open invitation by Voice Excellence, Johannesburg. Availability was a factor as delegates were required to attend training over a period of four months and the experimental group had to spend

³ The perception tests and the text used in the attitude assessment are in the possession of the researcher.

nine days in Potchefstroom. Cost was also a consideration which resulted in small groups (n=4). At final selection, each group consisted of three female and one male participant, varying in age between 22 and 39. All the participants are L1 Zulu speaking and use English in their front-line positions as Secretaries, Telesales agents, Receptionists and Call-Centre agents. All the participants come from multilingual backgrounds and use conversational Xhosa and/ or Tswana as well as Zulu

3.3 Procedures

3.3a Training programmes

Voice Excellence's⁴ 30-hour pronunciation programme for front-line personnel was used as a traditional programme. It incorporates phonetic instruction, repetition drills, audio-lingual practice and appropriate communicative carry-over.

Tomatis practitioners at the Tomatis Centre in Paris, France were consulted regarding the drafting of an APP programme for Zulu-speakers, since no information concerning such a programme could be obtained from the literature.⁵

The final programme, structured in terms of advice from the Tomatis Centre and assumptions about the participants' proficiency in English, consisted of recordings that contained traditional Zulu stories read in English (by the current researcher, as a speaker with L1 proficiency) as well as words and phrases, selected because of their prominence in South African business English. During the 60, 30-minute APP sessions the recordings were gradually filtered to 8,000 hertz and combined with recordings of music⁶ to facilitate relaxation, following active sessions. These

⁴ Voice Excellence (Pty LTD) is a private training company that specialises in communication related corporate training that includes language and pronunciation programmes.

⁵ Information was obtained verbally from APP practitioners during a meeting with W.F du Plessis at an international APP conference. Responses to specific questions by the researcher were documented during this meeting in.

⁶ As prescribed by the Tomatis method, Gregorian chants and Mozart concertos were

consisted of 30 minute periods of repeating words heard through ear phones, and reading English texts, while participants' voices were filtered through the Electronic Ear, to enlarge their awareness of the correct English pronunciation.

3.3b Tests and Stimuli

The same perception tests were conducted before and after the training programmes. Both groups participated in two perception tests that consisted of randomly ordered minimal pairs. The conclusions made in the comparative analysis between the vowel systems of Zulu and English were considered during the testing. Tests drafted by van den Heever and Wissing (1999) for their study into Tswana L1 interference on English vowels were used⁷.

Vowels that differ in quality, length and quality-and-length were used in the same consonantal context. For example:

sit /ɪ/,	seat /i:/	<i>difference in length</i>
hat /æ/,	hot /ɒ/	<i>difference in quality</i>
calm /ɑ:/,	come /ʌ/	<i>difference in length and quality</i>

A third word was added to minimal pairs to make the choice less obvious. For example:

seat	sit	<u>sat</u>
<u>hit</u>	hat	hot
<u>came</u>	calm	come
work	walk	<u>week</u>
hard	heard	head
bad	bed	bird

used.

⁷ These perception tests were chosen to facilitate potential future comparisons between the perception of Zulu and Tswana speakers.

still	steal	<u>stole</u>
wick	weak	<u>work</u>
will	wheel	<u>well</u>
chick	<u>chuck</u>	cheek
tan	turn	ten
lip	leap	<u>lap</u>
harm	ham	<u>hem</u>
heap	<u>hope</u>	hip
beat	bit	<u>bat</u>
<u>full</u>	fill	feel
<u>heel</u>	hill	<u>hall</u>
live	<u>love</u>	leave
it	<u>at</u>	eat
hit	<u>hurt</u>	heat

The underlined words represent the additional word that was added to the minimal pair to reduce a fifty-fifty choice. These were used in different combinations and a sample was provided above to save space. Where no underlined word occurs, the three words constitute minimal pairs when used in different combinations. Example:

tan ten
tan turn
turn ten

Initially an open-test was conducted. This implied that the same L1 proficient speaker, used in the APP recordings, read a list of words, containing the above mentioned vowel sounds. Words were read live, with 15-second intervals, during the pre and post-training tests. Tests for the experimental group were conducted as the Language Laboratory of Potchefstroom University and the control groups tests were conducted in a training room at Voice Excellence in Johannesburg. Both of the locations were noise controlled. The participants were asked to write the words down as they heard them. This was followed by a forced-choice test in

which the same words were read but the subjects were presented with three written options in each case and had to choose one. The focus was on the perception of English vowels, therefore errors with consonant perception were discarded.

3.3c Attitude Assessment

Before and after training, all participants were requested to read a short passage of text for recording. A short business text relating to customer service was chosen. These recordings were used as an attitude assessment to determine the attitude projected by participants as perceived by the business community. If the aim of corporate pronunciation training is to improve the intelligibility of speakers in the realm of their jobs it would be important to measure the perception of Managers and those who would offer employment. This was the motivation behind the attitude assessment – to measure the impact of the training programme and to establish the significance of differences between the two groups. To ensure a succinct assessment, as schedules did not allow lengthy procedures, the recordings of the participants with the best and worst results in each group were selected (n=2). This was based on the results achieved in the perception tests. The post-training recordings of these four participants were then played to middle and senior managers in the Information Technology, Financial, Insurance, Human Resources and Banking industries. The objective was to assess the responses of a cross-section of the Gauteng business community and to this end Managers from various language backgrounds participated. Twelve male and eight female managers who use English as a communication medium in their business communication participated. The distribution was as follows: eight L1 Afrikaans, five L1 English, two L1 Zulu, two L1 Sotho, one L1 Tswana and one L1 German. Availability was also a consideration and participants were chosen according to their profession rather than their language. Participants were told that the assessment was in aid of research but were not given any information regarding

the nature of the research. They were requested to assess the anonymous recordings as if they were potential employees or people in a customer service role. They were asked: ***“How would you respond if you had to hear the following person over the telephone?”***

They responded by grading the recordings as ***‘Excellent’***, ***‘Good’***, ***‘Acceptable’***, ***‘Weak’*** or ***‘Unacceptable’*** according to the following criteria:

- *Tone of Voice*
- *Clarity of speech*
- *Clarity of information*
- *Conversational attitude projected*
- *Friendliness displayed*
- *Responsiveness*
- *Level of Education displayed*
- *Chances of being employed in a front-line position*

A broader range of assessment criteria was chosen to render a general impact assessment opposed to a pure focus on pronunciation. The attitude assessment was conducted in a training room at Voice Excellence Johannesburg and a high quality cassette player was used.

3.4 Statistical Analysis

Microsoft Excel was used for the statistical analysis. In the analysis of the perception tests, percentages were determined as well as single factor ANOVA (Analysis of Variance). P-values were utilized to compare differences between the results of the two groups, to establish the statistical significance of results. Since the difference between the open and forced choice tests was insignificant the statistical analysis focused on the open test. This was decided upon because the open test is considered more difficult. Percentages were calculated for each criterion of the attitude assessment to form a general impression of the listeners’

perception of the subjects. Totals were determined based on the percentages achieved in each criterion.

4. RESULTS

4.1 Perception Accuracy

Table 1a: Analysis of Variance of all the subjects to determine the difference between the groups pre- and post training (open test)

Pre-Training		Post- Training	
Control Group	1. 352941	Control Group	1. 245098
Experimental Group	1. 374384	Experimental Group	1. 362745
P-value	P=. 6539	P-value	P=. 0097

Table 1b: Percentages of the amount of times (per word) accurate perception occurred in both groups pre- and post training (open test).

Pre- Training		Post- Training		P-value
				Of percentage improvement
Control Group	64.71%	Control Group	75.49%	P=0.017
Experimental Group	62.56%	Experimental Group	63.73%	P=0.8

Table 2: Analysis of each subject's results, amount of words perceived accurately, pre- and post training (open test).

Control Group	Pre- Training		Post- Training	Experimental Group	Pre- Training		Post- Training
	Pre- Training	Post- Training			Pre- Training	Post- Training	
Subject 1	33	44	Subject 1	45	48		
Subject 2	31	42	Subject 2	26	26		
Subject 3	33	33	Subject 3	31	31		
Subject 4	35	35	Subject 4	25	25		

The analysis of variance between the two groups pre-and post training (Table 1a) works on the premise that the p-value should be smaller than $p=0.05$ to be

statistically significant. Considering this the difference between the two groups is statistically insignificant pre-training ($p=.65$). The result post training shows a statistically significant improvement on the part of the control group ($p=.0097$). This could indicate that the APP programme did not have a significant impact on the vowel perception of the experimental group. It also indicates that the traditional programme rendered a marginal improvement. A similar result is noticeable in table 1b where the percentages of the amount of words that were perceived correctly are stated. The experimental group displays an insignificant improvement - 62.56% pre-training and 63.73% post training ($p=0.8$). Again the experimental group displays a more significant improvement of - 64.71% pre-training and 75.49% percent post training ($p=0.017$). This result supports the previous and indicates that the APP programme did possibly not have a statistically significant impact on the vowel perception of L1 Zulu-speakers. In table 2 the results of the individual participants and compared by means of the amount of words that the subject perceived correctly in the pre- and post training tests. It is interesting to note that only Subjects 1 and 2 in the control group displayed a significant improvement. The positive result of the control group is therefore based on the results of only two participants.

4.2 Attitude Assessment

Table 3: *Outcome of Attitude Assessment. Production as perceived by business community.*

CRITERIA	Excellent	Good	Acceptable	Weak	Unacceptable
Tone of Voice					
<i>Experimental Group</i>	37.5%	25%	17.5%	17.5%	2.5%
<i>Control Group</i>	10%	45%	35%	10%	
Clarity of Speech					
<i>Experimental Group</i>	30%	32.5%	22.5%	15%	
<i>Control Group</i>	10%	30%	50%	10%	
Clarity of information					
<i>Experimental Group</i>	25%	32.5%	27.5%	10%	5%
<i>Control Group</i>	7.5%	32.5%	32.5%	22.5%	5%
Conversational Attitude projected					
<i>Experimental Group</i>	25%	27.5%	17.5%	25%	5%
<i>Control Group</i>	2.5%	27.5%	40%	27.5%	2.5%
Friendliness displayed					
<i>Experimental Group</i>	20%	27.5%	22.5%	20%	10%
<i>Control Group</i>	10%	20%	40%	25%	5%
Responsiveness					
<i>Experimental Group</i>	17.5%	32.5%	22.5%	17.5%	10%
<i>Control Group</i>	10%	20%	45%	25%	
Level of Education displayed					
<i>Experimental Group</i>	22.5%	40%	27.5%	7.5%	2.5%
<i>Control Group</i>	10%	25%	52.5%	12.5%	
Chances for being employed in a front-line position					
<i>Experimental Group</i>	30%	22.5%	15%	22.5%	10%
<i>Control Group</i>	5%	20%	50%	20%	5%

TOTALS	Excellent	Good	Acceptable	Weak	Unacceptable
<i>Experimental Group</i>	29%	30.5%	22.5%	17%	4%
<i>Control Group</i>	8%	27.5%	43%	19.5%	2%

The totals calculated indicate that the experimental group was graded as “Excellent” by 28% of the participants where the control group received only 8%. Most participants graded the control group as “Acceptable”. It could be interpreted that although the differences are minor, the business community favoured the initial impact of the experimental group.

Since the results of the perception tests yield no significant difference between the two groups, the fact that the experimental group received more “Excellent” gradings could be due to other factors. One such factor could be the distribution of the groups. Subject 1 in the experimental group was selected for the attitude assessment. Table 2 indicates that this subject had the best results in the perception test. This might suggest that the specific subject had stronger language skills than the other participants, which might have affected the attitude assessment.

5. DISCUSSION

Certain design limitations need to be highlighted as they may have impacted on the results of this study. The most obvious limitation is the small sample of subjects used due to practical reasons. The subjects were also assigned to groups based on availability because the experimental group had to spend a significant amount of time away from their jobs. This made random assignments to groups impossible. Although the pre-training results of the groups suggest a difference that is statistically insignificant, random assignments might have

ensured more even distribution. The impact of an APP programme on the English pronunciation of L1 Zulu-speakers has never been tested before. This factor and limited literature available resulted in the study utilising an untested programme, based on assumptions about the group. Practical considerations also limited the duration of the programme. A brief AAP programme consisting of only 60 sessions spanning 11 days was conducted. This is less than the 100 sessions recommended.⁸ A more comprehensive assessment could possibly have rendered different results. Subjects reported improvements in their comprehension of English and their confidence when using the language. Perhaps additional tests could have explored these subjective statements. Another consideration is the limited amount of information available on APP programmes. During this study it proved to be impossible to find detailed documentation on APP language programmes. This study therefore relied on verbal communication with APP practitioners and it is possible that aspects might have been overlooked. Another factor that should be considered is that this study focused on pronunciation only whereas most APP programmes include aspects of syntax and comprehension as well (Gerritsen, 1996:4-5). The APP programme used was therefore untested and based on assumptions about the group. Perhaps this could be seen as a contributing factor to the negative results. Availability also limited the number of participants in the post hoc attitude assessment. These limitations need to be considered when the results of this study are viewed.

6. CONCLUSION

Although an improvement in the perception tests is visible in both groups, the results of the tests suggest a minor difference between the results of the two groups. A conclusion can therefore be stated that APP did not have a significant impact of the vowel-perception of subjects. The improvement in vowel perception

⁸ APP practitioners recommended one hundred sessions. Financial and logistic factors

could be contributed to the traditional programme in which both groups participated. The results of this pilot study are therefore that APP did not have a significant impact on the English pronunciation of Zulu-speakers.

The attitude assessment however indicates a preference for the subjects that participated in the APP programme. This might be accredited to improved voice production, increased confidence or a positive attitude as all these factors have been documented as possible results of APP (Tomatis, 1975; Tomatis, 1978 ; Tomatis, 1996 ; Madaule, 1993; Gerritsen , 1996). Since aspects such a voice quality were not tested in this study it is impossible to conclude in this regard. Tomatis documents effective results with Spanish children who used APP as an aid when learning French. (Tomatis, 1978:83-84). Gerritsen (1996: 4-5) sites two experiments in which APP was applied to complement language programmes. In the first, in 1979, a group of fifteen school children in Coomen Belgium were divided into two groups. One group received English teaching for an entire school year. The second group received APP training for three months followed by three months of regular instruction in English. Upon testing their comprehension and pronunciation of English the APP group produced better results. The second case study he mentions involves a corporate company, Eurocopter, who has been using APP to since 1989 to aid employees when learning foreign languages. Between 1989 and 1995, the progress of 580 employees who took part in APP language training was monitored. He states that a survey found that 25% of employees found the approach very effective, 63% found it effective and 14% found it moderately effective. He also sites the following results:

resulted in the shorter duration of the programme (sixty sessions).

92 % felt that their perception of the language improved
88% had better comprehension of the language
85% had more expressive intonation
86% perceived the sounds of a foreign language better
77% used the rhythm of the language more effectively
83% felt that their general communication skills improved.

Attempts to obtain more information about these studies also failed. This lack of empirical-backing causes APP's theoretical principles and approach to be questioned (Van Jaarsveld & Du Plessis, 1988: 136). They also state (1988:141) that a lack of controlled conditions implies that results cannot be contributed to the impact APP programmes alone. Although their work is in the field of Psychology the same conclusion can be made about the results achieved by APP in the field of Language Learning.

Certain controlled studies such as Weiss' (1985: 507) investigation into the Long Term Average Spectra of Continuous speech before and after Tomatis audio-vocal training, report accent and articulation improvements as a secondary result. Since this was not the primary focus of his study no detailed evidence is provided. The lack of documented test methodologies complicated the testing of the results of the APP programme.

Informal follow-up sessions with the subjects revealed that they felt their general comprehension of English had improved and that they felt more confident when using the language. This feedback was most common amongst the group that participated in the APP programme. The results of the attitude assessment can however, not be assigned to the impact of APP only. It could possibly be the combination of the two methods that resulted in this outcome. In assimilation of foreign languages (Tomatis, 1975:12-16) it is stated that APP enables learners

to adopt an auditory and psychological stance, appropriate to the target language. Although vague this statement could be interpreted as creating an appropriate mental set which facilitates skills that transcend beyond the specifics of the target language. As indicated by the Eurocopter employees this might explain the increased confidence and enhanced communication skills of learners who participate in an APP programme. This could also be a possible explanation for the positive results that the experimental group achieved in the attitude assessment. Since the measurement tools used in this study were specific to vowel perception no substantiated comments can be made about the above statement. Criteria such as voice quality, syntax usage and comprehension could provide a more holistic evaluation of APP as a complement to traditional programmes as should perhaps be considered for future research.

Another consideration is that the experimental group subjects that were used in the attitude assessment (one subject specifically) produced better results in the pre- and –post perception tests. It could be interpreted that this allowed a better disposition for pronunciation development. These simple and cost effective perception tests might have good potential as a measurement tool for pronunciation training in the corporate environment. The costs attached to the APP programme were high and this is another factor that renders its application in corporate training programmes unfavorable. Although the primary results of this study are negative, a secondary, more positive result is noted, namely the improved perception of vowels following the traditional training programme in which both groups participated. Despite limitations the traditional programme yielded an improvement in the vowel perception of L1 Zulu speakers. Two subjects in the control group displayed a statistically significant improvement in the pre-and post testing. A conclusion could be made, subject to the limitations of this study, that the traditional programme has value. Perhaps this should be explored further as the informal surveys indicated an increasing need of pronunciation training in the South African business.

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