Central Auditory Processing Disorders: Training and Knowledge of Urban Black Mainstream Primary School Teachers in Soweto

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This thesis is dedicated

to

my mother and the loving memory of my maternal grandmother,

my brothers for their love and support.

SUMMARY

TITLE: Central Auditory Processing Disorders: Training and Knowledge of Urban Black Mainstream Primary School Teachers in Soweto

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Central auditory processing disorders is one of those disorders that can have multiple outcomes like communication, learning and social adjustment problems. In many cases this disorder cannot be outgrown, but lots of children develop strategies to cope with or overcome it.

Literature has identified speech-language pathologists and audiologists as probably the most relevant and the best-equipped professionals in assessment of CAPD. However, the identification and eventual management of children with CAPD constitute a multidisciplinary team.

Teachers are among the core team members and they play a crucial role in identification, referral and management of children with CAPD. This role is specifically important in the case of black urban mainstream teachers because of issues such as high teacher-pupil ratios, noise pollution in schools and the lack of speech-language pathology and audiology services. Thus, the aim of this study is to investigate the level of training and knowledge of black urban mainstream primary school teachers in Soweto as far as CAPD are concerned.

A descriptive survey was conducted to determine the teachers training and knowledge of CAPD. A questionnaire was developed and distributed to Grade 1 to Grade 4 teachers in 55 primary schools. Responses of 308 questionnaires out of a total of 412 distributed, were analysed and interpreted. The results revealed that teachers are not

knowledgeable about and did not receive training on CAPD during their basic training period as teachers. Teachers also often confused CAPD with hearing impairment.

However, a positive attitude towards training on CAPD was evident from the teachers= responses. This calls for an urgent working partnership among different government departments (e.g. Health, Education, and Welfare), NGOs and communities in order to help children with CAPD to become full participants not only in the academic sphere, but also in all other areas of life.

Key words: *central auditory processing disorders, teachers, training and knowledge, children*

OPSOMMING

TITEL:	Central Auditory Processing Disorders: Training and Knowledge of Urban Black Mainstream Primary School Teachers in Soweto
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Versteurings op die gebied van sentrale ouditiewe prosessering is een van daardie toestande wat probleme ten opsigte van kommunikasie, leer en sosiale aanpassing tot gevolg kan hê. In baie gevalle is dit nie moontlik om hierdie versteuring te ontgroei nie, maar talle kinders ontwikkel strategieë om dit te hanteer of te oorkom.

In die literatuur word spraaktaalpatoloë en oudioloë as waarskynlik die mees relevante en bes toegeruste professionele persone vir die assessering van sentrale ouditiewe prosesseringsversteurings geïdentifiseer. Die identifisering en uiteindelike totale intervensie van kinders wat aan sentrale ouditiewe prosesseringsversteurings ly, is egter 'n multi-dissiplinêre taak.

Onderwysers is kernlede van die multi-dissiplinêre span en speel 'n uiters belangrike rol in die identifisering, verwysing en bestuur van kinders wat aan sodanige versteurings ly. Hierdie rol is veral belangrik in die geval van swart stedelike hoofstroomonderwysers, vanweë omstandighede soos hoe onderwyser-leerlingratio's, geraasbesoedeling in skole en die gebrek aan Spraak- en Taalpatologiese asook Oudiologiese Dienste in hierdie skole. Die doel met hierdie studie is dus om ondersoek in te stel na die vlak van opleiding en kennis van Swart stedelike primêre onderwys in Soweto aangaande sentrale ouditiewe prosesseringsversteurings.

'n Beskrywende opname is onderneem ten einde die onderwysers se vlak opleiding in en kennis oor sentrale ouditiewe prosesseringsversteurings vas te stel. Hiervoor is 'n vraelys ontwikkel en onder Graad 1 tot 4 onderwysers in 55 laerskole versprei. Die antwoorde in 308 voltooide vraelyste uit 'n totaal van 412 wat versprei is, is ontleed en geïnterpreteer. Uit die resultate blyk dit dat onderwysers nie kundig is ten opsigte van sentrale ouditiewe prosesseringsversteurings nie en dat hulle ook nie tydens hul basiese opleiding daaroor onderrig is nie. Verder verwar die onderwysers dikwels sentrale ouditiewe prosesseringsversteurings met gehoorbelemmering.

Die onderwysers se response het egter op 'n positiewe houding jeens opleiding in sentrale ouditiewe prosesseringsversteurings gedui. Dit is voldoende rede vir die ontwikkelings van 'n dringende werksvennootskap tussen verskillende regeringsdepartemente (bv. Gesondheid, Onderwys en Welsyn), asook nie-regeringsorganisasies en verskillende gemeenskappe, met die oog daarop om kinders met sentrale ouditiewe prosesseringsversteurings te help om uiteindelik suksesvol in die akademiese sfeer asook in al die ander terreine van die lewe te funksioneer.

Sleutelwoorde: *sentrale ouditiewe prosesseringsversteurings, onderwysers, opleiding en kennis, kinders*

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INTRODUCTION: PROBLEM STATEMENT AND RATIONALE OF THE STUDY

1.1 INTRODUCTION

A central auditory processing disorder (CAPD) places the child at a great disadvantage, both socially and academically, as it is one of the most disabling childhood disorders (Rampp, 1980). A central auditory processing disorder may impede the learning of children from all walks of life and may affect both their schooling and adjustment in society. This can be attributed to the fact that auditory processing (AP) is fundamental to learning language, and deficits in auditory processing can cause disorders in areas of language, reading, spelling and learning (Rampp, 1980; Keith, 1988; Katz and Wilde, 1985; Bellis, 1996; Bench and Maule, 1997).

In the school environment children are expected to listen, process, store, and retrieve auditory information while simultaneously self-monitoring their comprehension (Richard and Hanner, 1990; Truesdale, 1990; Katz and Wilde, 1994). The academic problems of some children with central auditory processing disorders stem from their difficulty in listening, understanding and making full use of auditory information (Money, 1962; Duane, 1977; Bruner, Cole and Lloyd, 1978; Lasky and Cox, 1983; Richard and Hanner, 1990; Katz and Wilde, 1994).

There is a strong relationship between auditory processing and learning disability (LD) (Rampp, 1980; Cacace and McFarland, 1998; Keller, 1998). LD has a significant impact on the child's ability to listen, think, speak, read, write, spell or doing mathematical calculations (Cacace and McFarland, 1998).

The term LD excludes children whose problems are due to physical, mental, emotional, environmental, cultural or economic disadvantage. (Rampp, 1980; Nielsen, 1997). Therefore, this means that among a group of learning disabled, children with central auditory processing disorders can be identified (Rampp, 1980; Katz and Wilde, 1985;

Riley, 1992; Gillet, 1993; Nielsen 1997; Keller, 1998). It therefore follows logically that some of the characteristics of learning disabled children are also present in children with CAPD, for example reading difficulties, spelling and language problems (Tansley and Panckhurst, 1981; Riley, 1992; Gillet, 1993; Katz and Wilde, 1994; Nielsen, 1997; Cacace and McFarland, 1998).

CAPD is a very controversial area (Peck, Gressard, and Hellerman, 1991; Cacace and McFarland, 1998; Keller, 1998; Chermak, Hall and Musiek, 1999). The controversy surrounding CAPD documented (Peck *et al.*, 1991; ASLHA, 1996; Cacace and McFarland, 1998; Bellis and Ferre, 1999; Friel-Patti, 1999; Jerger, 1998; Keller, 1998; Keith, 1999) revolves around:

- The definition – lack of consensus surrounding the definition CAPD.
- Diagnosis and management – lack of sufficient testing instruments and insufficient rationale for effective intervention.
- Characteristics displayed by children with CAPD – similar to those experienced by children with attention deficit hyperactivity disorder (ADHD) and learning disorder (LD).

Lack of agreement on the area of CAPD has rendered some authors and researchers to regard research as "futile" (Rees 1973 cited in Keith, 1999). Kamhi and Beasley (1985) cited in Keith, (1999:324) stated: "although it is relatively easy to identify children with CAP deficits, what it means to have such a deficit is not clear".

Some similarities observed in the characteristics of children with CAPD, ADHD and LD give rise to question of the existence of CAPD as being a single separate clinical entity (Peck *et al.*, 1991; Cacace and McFarland, 1998; Keller, 1998; Chermak *et al.*, 1999). It is still unknown if there is a cause and effect among the relationship of these disorders (Cacace and McFarland, 1998). This is due to the intricate relationships between these disorders (DeConde Johnson, Benson, and Seaton, 1997; Keller, 1998; Chermak *et al.*, 1999). Children with CAPD have been found to have ADHD and those experiencing ADHD have been found to have CAPD (Keller, 1998). Academic

problems and significant underachievement are common in children with CAPD, ADHD and LD (Keller, 1998).

Although there appears to be a strong relationship among the above-mentioned disorders, it is still unknown how they interact. They overlap in a very complex manner, which cannot be easily understood (Keller, 1998; Chermak *et al.*, 1999). According to Riccio, Hynd, Cohen and Molt (1994, cited in Keller, (1998:37), "ADHD and CAPD are separate diagnostic entities". Chermak et al., (1999) also differentiate between ADHD and CAPD view ADHD as a behavioural regulation disorder rather than a primary attention disorder. While CAPD is seen as an input disorder due to inadequate processing of auditory information (Chermak et al., 1999). Given these differences between ADHD and CAPD, it is suggested that CAPD and ADHD are not a singular disorder but rather distinct entities (Keller, 1998; Chermak *et al.*, 1999). Regardless of the controversy surrounding CAPD and the uncertainty of it being a clinical entity, it is crucial for teachers to know and understand the nature of the problem (i.e. listening problem and not a hearing problem) (Jerger, 1998). Furthermore, teachers need to be empowered regarding differences among CAPD, ADHD and LD as these disorders can occur independently or co-exist (Keller, 1998; Chermak, *et al.*, 1999). This could be achieved by educating teachers about the characteristics of children experiencing these disorders.

Although there has been a lot of research regarding CAPD and academic achievement (Katz and Wilde, 1994; Nielsen, 1997), it appears that the findings have not been recognized universally and they have not been implemented in the educational setting in South Africa (SA), especially among the black community. This is apparent from the researcher's clinical experience which suggests that children with CAPD are referred to the speech-language pathologist and audiologists with reports stating that the "the child has hearing problems" or "the child is deaf" even when there is no medical or audiological confirmation of ear and hearing problems. This lack of understanding and knowledge about CAPD can most likely be attributed to fragmented educational policies, lack of human resource and financial problems where funds were not available for projects dealing with children who have special needs (NCESS, 1997) including

CAPD (SASLHA, 2001).

The Apartheid policies have produced teachers that have not necessarily been adequately educated or trained themselves especially dealing with children with disabilities and disorders. This resulted in most teachers not being aware of some of the professionals (for example, speech-language pathologists and audiologists) involved in assisting children experiencing difficulties in the educational sphere. The researcher's clinical experience suggests that the majority of teachers have not received training regarding CAPD in children. Children with CAPD are frequently referred to medical doctors as a hearing disorder is suspected.

It is therefore the aim of this chapter to delineate the problem of central auditory processing disorders (CAPD) in South Africa, and more specifically in black primary schools in Soweto, and to indicate the rationale for a research project in this field.

1.2 ORIENTATION TO AND RATIONALE FOR THE STUDY

The definition of central auditory processing disorders remains elusive and yet there is a similarity between definitions. Wepman (1969, cited in Rampp, 1980:8) defines auditory processing as "the capacity to collect, transmit, decode and integrate signals received along the auditory pathway". Another definition given by Berry (1969, cited in Rampp, 1980:8) outlines auditory processing as "the act of meaningfully interpreting or discriminating sounds and sound sequences employed in oral communication". Therefore, a central auditory processing disorder is a deficit in the areas of auditory processing. The term "central" refers to the brainstem and cortical areas of the auditory nervous system. It excludes the cochlea and the auditory nerve (peripheral auditory system) (Keith, 1999). Although the peripheral auditory mechanism of a child with a central auditory processing disorder is intact, the child is however, unable to interpret what he or she hears. CAPD can also be present in individuals with hearing loss (Keith, 1999) but this complex research area still requires substantial research and is beyond the scope of this study. Johnson and Myklebust (1967, cited in Rampp, 1980:

9) describe such children as lacking the ability "to structure their auditory world, sort out and associate sounds with particular objects and experiences". They store auditory information haphazardly, which results in inefficient and frustrating language retrieval (Richard and Hanner, 1990). On a more practical level, Richard and Hanner (1990) and Katz and Wilde (1994) state that children with CAPD are unable to make full use of the auditory signals they have received.

In the clinical situation it has been found that there are two different approaches in the conceptualisation and management of CAPD, namely, the *Audiological approach and the Speech-Language Pathology approach*. The Audiological approach, reflected in Wepman's definition (Rampp, 1980) suggests that a central auditory processing disorder manifests itself in the inability to understand distorted speech and the inability to listen to the primary signal (meaningful or intended signal) while ignoring a competing signal (noise, non-meaningful or unintended signal) (Campbell, 1994; Bench and Maule, 1997). The difficulty experienced in the understanding spoken language in the presence of noise, occurs in the absence of what is commonly considered a hearing loss (Lasky and Katz, 1983; Katz and Wilde, 1985; Willeford and Burleigh, 1985; Sloan, 1986; Keith, 1988;Campbell, 1994). The peripheral hearing thresholds of children with this type of disorder are normal when tested with puretone audiometry and speech discrimination word lists (in a sound-proof testing booth). However, when the Central Auditory Nervous System (CANS) is placed under stress by decreasing the redundancy of speech material, or by of increasing the informational content (complexity) or increasing the background noise, children with CAPD perceive the auditory information inaccurately and therefore respond inappropriately (Keith, 1981; Willeford and Burleigh, 1985; Bench and Maule, 1997).

According to the ASLHA CAPD Task Force (ASLHA Task Force on Central Auditory Consensus Development, 1996:41) the problem in the above type of central auditory processing disorder is: "the deficiency in one or more of the processes and mechanisms responsible for sound localization and lateralization, auditory discrimination, auditory pattern recognition, temporal masking, temporal integration, temporal ordering, temporal resolution, auditory performance decrements with

competing acoustic signals and auditory performance decrements with degraded acoustic signals" (ASLHA, 1996). The deficit, which result from one or more of the above processes and mechanisms, is referred to as ***Central Auditory Processing Disorder*** (CAPD).

The second approach to central auditory processing disorders, namely that of the Speech.

Language Pathology views CAPD as a deficiency in auditory-based linguistic skills and is reflected in Berry's definition of auditory processing (Rampp, 1980). The deficiency is manifested in one or more of the linguistic skills involving phonological awareness, auditory analysis (gross sound and speech sound discrimination), auditory synthesis (auditory closure and sound blending), auditory memory (short and long term memory and sequencing) (Willeford and Burleigh, 1985; Cline, 1988; Campbell, 1994). This type of central auditory processing disorder is usually referred to as a ***Linguistically dependent (or Language-Based) Central Auditory Processing Disorder*** (Campbell, 1994).

The two different approaches to CAPD are possibly due to the differences in the training offered to speech-language pathologists (SLP) and audiologists in this area. The differences have given rise to controversy in the literature regarding central auditory processing and the role of the audiologist and speech-language pathologist in the management of CAPD.

In recent years, the use of subprofiles (Bellis, 1996) or categories (Katz and Wilde, 1994), has been recommended as the integration of audiological and speech-language assessment results can be linked to a site of dysfunction, specific areas of dysfunctions and management guidelines. Katz and Wilde (1994) highlighted four different categories of children with central auditory processing disorders. Bellis (1996) described five different subprofiles of children with central auditory processing disorders which are divided into three primary profiles and two secondary profiles. The categories and subprofiles as suggested by these authors are presented in Table 1.1

and Table 1.2 respectively.

Table 1.1 A summary of central auditory processing disorders as proposed by Katz et al. (1991) and Katz (1992) cited by Katz and Wilde (1994).

Auditory Processing Category	Site of Lesion	Experienced Difficulties/Problems
Decoding Category	Primary Auditory Cortex.	Poor phonic ability, problem with reading and spelling, misarticulation at early school age (especially /r/ sound) and receptive language problems.
Tolerance-Fading Memory ((TFM)	Primary and associative cortical regions.	Difficulty blocking out background noise, poor short term memory for digits and sentences, distractible, hyper- and hypoactivity, difficulty with reading comprehension, problems with oral and written expression and poor handwriting.
Integration	Corpus callosum	
Type 1	Primary Auditory Cortex.	Extremely poor reading and spelling skills (Dyslexia), poor phonic ability.
Type 2	Primary and associative cortical regions.	Long delay responses, academic picture is like that of TFM.
Organization	Not certain - possibly the efferent nervous system.	Organizing and sequencing problems, messy, untidy, fatigue easily, easily frustrated, academic difficulties not clear, might have spelling problems (especially reversing the order of letters).

Table 1.2 A summary of Bellis (1996) central auditory processing disorders subprofiles

PRIMARY CENTRAL AUDITORY PROCESSING DISORDERS PROFILES		
Auditory Processing Subprofile.	**Site of Lesion**	**Experienced Difficulties/Problems.**
Auditory Decoding Deficit	Primary (left) Auditory Cortex	Poor sound blending, poor analytic skills, poor spelling (word attack), difficulty understanding speech in noisy environment, mimics hearing loss.
Prosodic Deficit	Non-primary (right) Auditory Cortex and associated areas	Difficulty with spelling (sight word), difficulty judging communicative intent, difficulty with perception and use of prosody, have monotonic speech, difficulty with visuospatial and mathematics calculations, socio-emotional concerns.
Integration Deficit	Corpus Callosum	Difficulty with multimodality functions, poor speech in noise skills, phonological deficits, difficulty with symbolic language and prosody, auditory language and memory deficits, difficulty with tasks requiring interhemispheric integration.
SECONDARY CENTRAL AUDITORY PROCESSING DISORDERS SUBPROFILES.		
Auditory Associative Deficit	Left (associative) cortex.	Receptive language deficits, problems with semantics and syntax, difficulty comprehending information of increasing linguistic complexity, poor reading comprehension, poor math application.
Output-Organization Deficit	Temporal-to-frontal and/or efferent system	Problems with sequencing, planning and organizational skills, poor recall and word retrieval abilities, difficulty with following directions, poor fine and gross motor skills, poor hearing in noise, difficulties with expressive language.

The sub-profiles/categories described in Tables 1.1 and 1.2 may occur in isolation or in any combination. In a study conducted by Katz and Burge (1992 cited in Katz and Wilde, 1994) on 120 (6 -12 years of age) children with learning disabilities, revealed that more than 50% of these children fall into two or more categories of CAPD (Katz and Wilde, 1994). This means that these categories/subprofiles are not mutually exclusive (Katz and Wilde, 1994).

Central auditory processing is a complex disorder with far-reaching implication (Katz and Wilde, 1985; Bellis and Ferre, 1999), necessitating a collaborative approach to the management of CAPD in children. Professionals like Teachers, Audiologists and Speech-Language Pathologists, Psychologists and Physicians are among some of the core members of the team associated with the identification, referral and remediation of CAPD (Willeford and Burleigh, 1985; Bellis, 1996). While all of these professionals play an important role in managing children with CAPD, it is perhaps the teacher whose role is the most significant. Teachers spend a large portion of the day with the child in the educational setting. They play an important role in providing information to the other team members regarding the child's listening and learning behaviour within the learning environment, academic strengths and weaknesses as well as the child's cognitive functioning (Giliomee, 1995; Bellis, 1996). Therefore, it is essential for them to have some knowledge of auditory processing disorders in order to identify, refer and assist children in the classroom.

Efficient processing of auditory information is crucial for the child's adjustment and learning as 70% of all information given by primary school teachers is oral (Rampp, 1980). This situation is complicated by the fact that competing messages are often an integral part of the learning situation (Rampp, 1980). The intended message is often subject to distortion or disruption by noise, music and/or the speech of the others (Rampp, 1980). It is logical to conclude that children with

CAPD are at a disadvantage in the learning situation, since they have difficulty or are unable to follow conversation in the presence of background noise – which is typical of the classroom situation. This problem can, in turn, lead to difficulty with the storing

and/or retrieving auditory information, which may result in a child being labelled as "learning disabled".

CAPD challenges in South Africa (S.A.) are quite different from overseas. South Africa is a multicultural and multilingual country with 11 official languages. The majority of the citizens of S.A. have low socio-economic standard (SASLHA, 2001). The policies of the past Apartheid system have contributed in producing teachers that have not always been adequately trained, as mentioned previously, and working in difficult circumstances (NCESS, 1997; SASLHA, 2001) whereas they are ideal persons to train in identifying and managing children with CAPD (Bellis, 1996). A limited number of speech-language pathologists and audiologists in relation to the number of children needing help is an area of concern. Furthermore, lack of South African standardized materials, resources such as place of referral following diagnosis and intervention procedures are amongst the challenges in area of CAPD service delivery (SASLHA, 2001).

It is estimated that 50% of children in South Africa are learning impaired, due largely to inadequate education caused by the Apartheid system (Kriegler, 1989). It is possible that difficulties associated with a large percentage of these children stem from CAPD related to the disadvantaged background and unfavourable listening environment in which they find themselves (for example, having to learn outside under the trees due to lack of classrooms, large classrooms with poor acoustic, low socio-economic factors). These children seldom receive early intervention due to a lack of exposure to speech-language pathology and audiology as these professions are relatively unknown among the black communities. According to the Gauteng Department of Education, there are currently 279 primary schools in Soweto attended by 154,121 children, and there are no speech-language pathologists and audiologists servicing those schools (Gauteng Department of Education, 1999). Furthermore most of these children are from a very poor socio-economic and political backgrounds, which is an additional complicating factor. The training of teachers in the field of CAPD could be time and cost effective, since individual intervention is largely impractical in terms of time and cost.

All children have the right to appropriate educational experiences (NCESS, 1997). This refers also to handicapped children, non-handicapped and children with different childhood disorders (Alper, Schloss, Etscheid, Macfarlane, 1995; IDEA, 1990 cited in Nielsen, 1997). Unfortunately most teachers - especially mainstream primary school teachers in South Africa - are not trained to work with children with disabilities and disorders, especially not with children with CAPD. The current move in the South African educational system towards the integration of children with disabilities into mainstream schools will result in larger numbers of children per class, increased noise levels and less individual attention (Giliomee, 1995; NCESS; 1997). This may potentially place a child with a CAPD at an even greater disadvantage. Thus, it is crucial for teachers to receive information about and suggestions for the integration of children with CAPD or other disabilities and disorders in their classrooms. Teachers are also regarded as key persons in providing information regarding children's physical, emotional, academic and social behaviours and they consequently play an important role in the identification and referral of children with disorders to different specialists (Giliomee, 1995; Bellis, 1996). In the case of CAPD, and specifically against the background of the new educational system in South Africa and lack of speech-language pathologists and audiologists in mainstream schools, teachers have a crucial role to play in managing the intervention process and carrying out remediation programmes.

As CAPD may lead to academic failure and limit the child's potential for learning, it is crucial for teachers to have knowledge of such disorders. Training of teachers about CAPD will enable them to manage children with these disorders with the required insight and knowledge so as to help them overcome the typical difficulties that they experience (Bellis, 1996; NCESS, 1997). Integrating children with CAPD in their classrooms and helping with their remediation will also help teachers not only to value these children for their unique strengths, but also to understand their disorders better. Finally, expanding teachers' knowledge of CAPD will result in early identification of and thus early intervention in these disorders (Giliomee, 1995; Bellis, 1996). According to Flynn (1983), early detection of disorders is prognostically advantageous. This should help to curb the high rate of high-school dropouts, limit the social maladjustment of children with learning disability resulting from CAPD and deal with the withdrawal

behaviours that stem from the continuous frustration and confusion experienced by children with CAPD.

Therefore, it is crucial that teachers should become aware of CAPD and be able to recognize them. They should also be exposed to the strategies employed in alleviating such disorders, since there will probably never be enough specialists to assist children with CAPD on an individual basis (Rampp, 1980). Educating teachers in areas of CAPD, providing them with methods of adapting the classroom situation to provide maximum benefit for a child with such a disorder and helping teachers to implement programmes that could possibly help children with CAPD will be a positive step, aimed at preventative rather than curative action (Egland, 1970; Norris, 1989).

From to the researcher's clinical experience it seems that teachers lack knowledge of CAPD. Their approach and attitude towards the behaviours displayed by children with such disorders is negative and there is often a stigma attached to the child. This is probably due to black communities' lack of exposure to speech-language pathology and audiology, and the role-played by these professions in the educational sphere. As mentioned previously, there are no speech-language pathologists and audiologists working in mainstream schools in Soweto. Against this background it becomes imperative that an answer to the following question should be found: What is the ***training*** and ***knowledge*** of primary school teachers in urban black schools pertaining to CAPD?"

1.3 DEFINITION OF TERMS

Although terms like *learning disability* and *language* do not occur in the title of this study, the researcher feels that they need to be defined due to the intimate relationship that exist among learning disability, language and CAPD. Furthermore, language is basic to all definitions of learning disability (Rampp, 1980). The co-occurance of language, central auditory processing and learning disabilities is well documented (Johnson and Myklebust, 1967; Rampp, 1980; Reid and Hresko, 1981; Kirk and Chalfant, 1984; Lerner, 1985; Parnell, Amerman, and Harting, 1986; Camatra, Hughes

and Ruhl, 1988; Norris, 1989; Riley, 1992; Gillet, 1993; Nielsen, 1997).

To clarify the terminology used in this study, the following terms will be defined.

1.3.1 Central auditory processing and central auditory processing disorders (CAPD)

It seems that there is a lack of agreement on the definition of auditory processing. According to Katz and Wilde, (1994) and DeConde Johnson, Benson and Seaton (1997) auditory processing is "what people do with what they hear" to make the information they have heard to be functionally useful/meaningful. Furthermore, auditory processing is the ability of receiving, transmitting, discriminating, sequencing and interpreting auditory information meaningfully to be functionally useful. Since hearing is normal, this means that the ear receives all auditory information (meaningful and non-meaningful), while the skills referred above (i.e. synthesis, analysis, discrimination and integration) facilitate the process of making the received auditory information functionally useful/meaningful (Berry, 1969 cited in Rampp, 1980; Wepman, 1972 cited in Rampp, 1980; Katz and Wilde, 1994; DeConde Johnson *et al.*, 1997).

As quoted earlier, central auditory processing (CAP) "involves processes and mechanisms that are responsible for auditory abilities such as sound localization, auditory discrimination, auditory pattern recognition, temporal aspects of audition including temporal resolution, temporal masking, temporal integration, temporal ordering, auditory performance decrements with competing acoustic signals and auditory performance decrements with degraded acoustic signals" (ASLHA Task Force on Central Auditory Consensus Development, 1996:41). Therefore, CAPD could be deficiencies in one or more of the auditory abilities mentioned above, the dysfunction of the processes and mechanisms dedicated to audition, general dysfunction (such as attention deficit or neural timing deficits) that affects performance across modalities, or any combination of the above (ASLHA, 1996). Although this definition is a collective effort of the ASHLA Task Force on Central Auditory Consensus Development, the definition of CAPD still remains a mystery. The definition of the ASLHA Task Force on Central Auditory Consensus Development (ASLHA, 1996) has received criticism from

authors such as DeConde Johnson *et al.*, (1997) for being too complex and difficult to be understood by non-experts and lay people. It is clear that uncertainty still surrounds the definition of CAPD.

It was suggested that the term auditory processing disorders be used in place of central auditory processing disorders at the Bruton Conference held in 2000 (Medwetsky, 2002) as the term auditory processing avoids the imputation of anatomical loci and emphasizes the interaction of disorders at both peripheral and central sites. This suggestion has however not been implemented by most researchers as reflected in recent publications (Medwetsky, 2002). For this reason the term CAPD will be used in this dissertation although the term "auditory processing" is used in the questionnaire as the term "central" is not a familiar term to the subjects, based on the researcher's clinical experience.

The definitions of CAPD as provided by Katz and Wilde's (1994) and DeConde *et al.* (1997) facilitate an understanding of the disorder in lay persons (the subjects of the study). Furthermore, Berry's (1969) and Wepman's (1972) respective definitions of auditory processing as cited by Rampp (1980:8), stating that auditory processing is "the act of meaningfully interpreting or discriminating sounds and sounds sequences employed in oral communication" and "the capacity to collect, transmit, decode and integrate signals received along the auditory pathways", appear to facilitate understanding of CAPD and avoid technical jargon. Hence, in this study the researcher would like to use a combination of these definitions to define the disorders. Combining these definitions is in line with the current efforts to bring the speech-language pathology and audiology approaches together when dealing with children with CAPD (Bellis, 1996). This will promote the idea of looking into a child's academic, communicative, behavioural, social and associated difficulties.

For the purpose of this study, Berry's (1969) and Wepman's (1972) definitions will therefore be combined with those of Katz and Wilde (1994) and DeConde Johnson *et al.*, (1997) resulting in the following definition:

Central auditory processing disorder (CAPD) is the inability to receive, transmit, discriminate, integrate, sequence and interpret auditory information meaningfully so as to be functionally useful (despite the individual having normal hearing).

1.3.2 Learning Disability (LD)

According to the United State Congress in 1977 (Section 5b, cited in Rampp, 1980:8) and the *Individual Disabilities Education Act* of (1990) (cited in Nielsen, 1997:65) learning disability is "a disorder in one or more of the basic psychological processes involved in understanding or in using language, spoken or written which may manifest itself in an imperfect ability to listen, think, speak, read, write, spell, or to do mathematical calculations. This term does not include children whose problems are primarily the result of visual, hearing, or motor handicaps, mental retardation, emotional disturbance, environmental, cultural, or economic disadvantage." This definition of learning disability will be used in this study.

1.3.3 Language

Bloom and Lahey (1978:4) define language as "knowledge of a code for representing ideas about the world through a conventional system of arbitrary signals for communication". Therefore, normal language processes that lead to normal processing of language for learning require intact end organs and intact central processors. Disturbances in one or both of the areas affect the child's language acquisition, which in turn affects his/her learning.

1.3.4 Training

Training is the process of developing attitudes, knowledge and skills required for adequate performance of a particular task or job (Creek, 1997). Training is conducted by a person who is knowledgeable about the subject and can occur in different forms at different venues.

1.3.5 Knowledge

Knowledge is an organized integrated body of information about a particular subject (Garbers, 1996). In terms of this study, the knowledge on CAPD will facilitate the management of children with such disorders

1.4 DIVISION OF CHAPTERS

In order to provide a clear answer to the research question "What is the ***training*** and ***knowledge*** of primary school teachers in urban black schools pertaining to CAPD?", the thesis is divided into six (6) chapters.

CHAPTER 1: PROBLEM STATEMENT AND RATIONALE OF THE STUDY

This serves as an introduction of the research question, which is "What is the ***training*** and ***knowledge*** of primary school teachers in urban black schools pertaining to CAPD?". The rationale and motivation for the study are presented in Chapter 1. The clinical experience of the researcher serves as the basis for the motivation of the study and revealed lack/poor relationship between speech-language pathologists and audiologists and teachers in black communities.

The review of literature briefly highlights the relationship between CAPD and academic achievements of children with such disorders. Definitions of terms and subprofiles/categories of children with CAPD are also discussed.

CHAPTER 2: CENTRAL AUDITORY PROCESSING DISORDERS (CAPD) IN THE SCHOOL-AGED CHILD

The consequences of CAPD in the school-going child manifest themselves mainly in the academic sphere. In this chapter problems experienced by children with CAPD and survey of literature regarding etiology of CAPD and behaviours displayed by children with CAPD are discussed. An explanation of classroom-specific behaviours and

behaviours that affect the child's social adjustment is also given.

CHAPTER 3: CENTRAL AUDITORY PROCESSING DISORDERS (CAPD): THE ROLE OF THE TEACHERS, SPEECH-LANGUAGE PATHOLOGIST AND AUDIOLOGIST IN THE EDUCATIONAL SETTING

The evaluation and remediation of CAPD require a multi-disciplinary approach. Chapter 3 discusses the role of the different team members involved in evaluation and remediation of children with CAPD. However, the focus is on the role of the teachers in terms of management and the role of speech-language pathologists and audiologists against this background. The relationship of team members and the need for the continuing education of teachers are also discussed in this chapter.

CHAPTER 4: METHODOLOGY

This chapter presents the research methodology of the study. It comprises of a description and discussion of aims, research design, subjects and subject selection criteria and procedures, apparatus and material, data collection procedures and finally the data analysis procedures used in the study.

CHAPTER 5: RESULTS AND DISCUSSION

This chapter presents the results of the study, treatment of data, and the interpretation and discussion of results contained in Chapter 4. The results are presented according to the developed sub-aims. The chapter commenced with discussing the role that teachers play for all children, including those with disabilities/disorders. The training and knowledge of teachers with regard to CAPD are subsequently analysed and interpreted.

CHAPTER 6: CONCLUSIONS AND IMPLICATIONS

This is the concluding chapter and it contains recommendations and a summary of the study. Attention is also given to recommendations for further research and a discussion

of the clinical implications of this study.

1.5 SUMMARY OF CHAPTER 1

Chapter 1 deals with the orientation and rationale of this study. The relationship between CAPD and learning abilities (which are addressed in Chapter 2) was discussed briefly. Another theme dealt with in this chapter is the different categories/subprofiles of children with CAPD, that link CAPD test results to site of dysfunction, areas in which academic difficulties are observed and management programs. The terminology used in the study is defined and outlines of the content of the chapters of the study are provided.

2. CHAPTER TWO:

CENTRAL AUDITORY PROCESSING DISORDERS IN THE SCHOOL-AGED CHILD

2.1. INTRODUCTION

A central auditory processing disorder (CAPD) is a very complex and obscure disorder (DeConde Johnson *et al.*, 1997). Although it is not rare, it can go unnoticed for several years until the child enters school (Stach and Loiselle, 1993). The United States Association for Children with Learning Disabilities reported that between eight and twelve million children in the United States are learning-disabled and majority of them have CAPD (DeConde Johnson *et al.,* 1997). CAPD not only disrupt the absorption of auditory materials, but also the cognitive processes that involve the auditory pathway such as attention, concentration and thinking (Bench and Maule, 1997). CAPD constitute one of the major disorders that handicap children face (Cacace and MacFarland, 1998; Keller, 1998; Chermak *et al.,* 1999) in the academic sphere. Their ability to process information for learning and communication is affected, with the result that some children with CAPD may experience learning difficulties (Young and Protti-Patterson, 1984; Riley, 1992; Gillet, 1993; Katz and Kusnierczyk, 1993; Bellis, 1996; Bench and Maule, 1997; Nielsen, 1997).

The co-occurance of CAPD and learning difficulties is well documented (Johnson and Myklebust, 1967; Rampp, 1980; Reid and Hresko, 1981; Kirk and Chalfant, 1984; Lerner, 1985; Parnell, Amerman and Harting, 1986; Norris, 1989; Riley, 1992; Gillet, 1993; Katz and Wilde, 1994; Nielsen 1997). The skills that are mostly affected in children with CAPD are precisely those that can also play an important role in academic achievement, for example reading and spelling (Katz and Wilde, 1985; Katz and Wilde, 1994; Bench Maule, 1997). The result of this is that some children with CAPD are often labelled as being learning disabled.

The aim of this chapter is to provide the necessary background information of children with central auditory processing disorders (CAPD) by considering aspects such as etiology and prevalence, behaviours and symptoms of school age children with CAPD, as well as the impact of CAPD on academic learning and progress.

This study will follow the current approach by looking at a child holistically and utilizing both approaches to CAPD (namely, that of the Speech-Language Pathologist and the Audiologist). The reason for this is that both types of approaches recognize the impact of such disorders on the academic, social and communicative abilities of children, although from different perspectives.

2.2. ETIOLOGY AND PREVALENCE

A CAPD is not a single entity (Katz and Wilde, 1994; Keller, 1998). Although the condition is definable, its exact *etiology* as observed in school-age children is unclear and often controversial (Barr, 1972; Katz and Wilde, 1985; DeConde Johnson *et al.*, 1997).

Some conditions have been identified as probable role players in the etiology of CAPD, namely, a genetic predisposition, abnormal brain maturation, lack of myelination of corpus callosum, lesions in diverse brain areas and general brain damage caused by conditions like anoxia and/or trauma (Barr, 1972; Musiek, Gollegly and Baran, 1984; Katz and Wilde, 1985; Pinheiro and Musiek, 1985; Bellis, 1996). However, it must be remembered that it is often very difficult, even in the case of specific conditions like brain lesions, to identify them as a definitive causative factor for CAPD. Brain maturation is highly individualized and only completed over a number of years (Pinheiro and Musiek, 1985; Musiek and Chermak, 1994; Bellis, 1996). In human beings the myelination of the corpus callosum is also reported to be completed only during adolescence (Musiek, Gollegly and Baran, 1984; Pinheiro and Musiek, 1985). On the other hand, most children referred for evaluation and treatment of CAPD are not

adolescents but young children in their early years of schooling, and their neural mechanism is still in the process of maturation.

It is furthermore important to note clinicians find it difficult to determine the exact site of lesion from results observed on central auditory evaluation. This is due to the fact that lesion in the brain may affect areas of the brain remote from its actual location because of interference with neural transmission of the biochemistry of the brainstem or cerebrum (Pinheiro and Musiek, 1985). This situation is fortunately improving, particularly with the advances in Electro-physiological measurements. These measures enable clinicians to observe the function of the Central Auditory Nervous System (CANS) and the procedures have demonstrated good sensitivity and specificity (Katz and Wilde, 1994; Bellis, 1996).

One condition that has been positively identified as an etiological factor of CAPD is recurrent otitis media (Duane, 1977; Rampp, 1980; Katz and Wilde, 1985; Keith, 1988; Katz and Wilde, 1994; Bellis, 1996; DeConde Johnson *et al.,* 1997). This condition is very common in young children and results in a fluctuating conductive hearing loss (Katz and Wilde, 1985; Ferman, Verschuure and van Zanten, 1993; Bellis, 1996). The fluid in the middle ear resulting from middle ear infection causes physiological changes that affect the conduction of sound to the inner ear. This causes the distortion of sounds and an inability to perceive sounds and short words with low acoustic energy. In addition, a child with fluctuating hearing loss experiences continuous changes in sound perception. This can be confusing to a child and often leads him/her to regard speech sounds as being unstable (Katz and Wilde, 1985; Campbell, 1994;Katz and Wilde, 1994; Bellis, 1996).

Katz and Wilde (1985) have also reported structural changes of the cochlea, the retrocochlear system and the brain due to deprivation of normal auditory activity as a result of fluctuating conductive hearing loss due to otitis media. Such fluctuating conductive hearing loss during the early developmental years of life results in a child being at risk for developing speech and language disorders as well as learning and auditory processing problems (Van Riper and Emerick, 1984; Katz and Wilde, 1985;

Katz and Wilde, 1994; Bellis, 1996) that often become observable at school going age only.

Other possible causes of CAPD that have been reported in the literature by Kelly, Davis and Hedge (1994) include the following:

- Organic disorders of deafness.*
- Neoplasms and tumours.
- Demyelinating diseases, including Multiple Sclerosis.
- Cerebrovascular diseases, including Stroke.
- Degenerative diseases, including Alzheimer's disease.
- Perinatal and paediatric neuropathy, including various genetic disorders and asphyxia at birth.
- Infectious and inflammatory diseases, including human immuno deficiency virus (HIV/AIDS).
- Miscellaneous neuropathy, including meningitis.

Apart from the above-mentioned disorders, studies indicate that the majority of school-going children with CAPD present without identifiable organic causes (Kelly, Davis, and Hedge, 1984; Campbell, 1994). The medical, birth and familial histories of these children do not necessarily display any information that can be associated with their CAPD. They may have normal or high intelligence but still experience difficulty with auditory processing (Campbell, 1994; Bellis, 1996). With regard to family history, Katz and Wilde (1994) as well as Bellis (1996) have reported that it is common in children with CAPD that one parent had a similar disorder in his/her youth, and it can therefore be concluded that in some cases this condition may be hereditary (Katz and Wilde, 1994; Bellis, 1996).

Furthermore, the improper neural migration during foetal development and variables in the brain structure may be associated to the heredity of CAPD (Rampp, 1980; Katz and Wilde, 1994). It was also observed that in the families of children with CAPD there is a history of left-handedness (Rampp, 1980; Katz and Wilde, 1994). This can perhaps

relate to the fact that reading and other cognitive disabilities are reported to be more common in left-handers than right-handers (Katz and Wilde, 1994). However left-handedness alone does not necessarily imply the presence of a CAPD.

The etiology of CAPD in school going children is thus controversial. The fact that there is no evidence that the brain has processed auditory signal incorrectly (Jerger, 1998) makes it difficulties to get the exact etiology of CAPD. According to Jerger (1998) even the electrophysiological measures do not provide a "gold standard" for the diagnosis of CAPD. It appear that clinicians and researchers still have a long way to go to try and uncover the mystery of the etiology of CAPD in school going children and whether it originate from a single or multiple factors.

The *prevalence* of CAPD is reported to be higher in boys than in girls (Katz and Wilde, 1994; DeConde Johnson, *et al.,* 1997; Chermak, Hall and Musiek, 1999). Musiek, Gollegly , Lamb and Lamb, (1990 cited in Chermak, Hall and Musiek, 1999) reported the prevalence of CAPD to be 3% to 7% among boys and girls respectively, whereas Chermak and Musiek (1997) mentioned that it occurs in 2% to 3% of children, with a ratio of 2:1 for boys and girls (Chermak et al., 1999). One of the factors that attribute to this difference between the sexes is the structure of the corpus callosum where reading and spelling abilities are based. Girls are reported to have a large and bulbous splenium (the area responsible for transmitting auditory and visual information between the two hemispheres) (Katz and Wilde, 1985), with the result that they are able to integrate auditory and visual information from the two hemispheres more effectively than boys (Katz and Wilde, 1994).

It is difficult to study the prevalence of CAPD due to the following:

- Lack of standard definition and terminologies used,
- The fact that mild CAPD are easily compensated for when educational demands are minimum,
- The variability of auditory performance in children up to 12 - 13 years of age and
- The different approaches for assessing and managing children with CAPD (Keith, 1988 in Roesner and Downs, 1988).

Nevertheless, as mentioned previously, it is estimated that between eight and twelve million of children in the USA with learning disabilities have CAPD (Keith, 1988; DeConde Johnson, *et al.*, 1997). In South Africa the number of children with learning disabilities resulting from CAPD is probably even higher, due to the poor listening environment in which they find themselves most of the time, combined with a lack of stimulation, poor socio-economic factors and a lack of adequate early identification and intervention.

2.3. BEHAVIOURS AND SYMPTOMS OF CHILDREN WITH CENTRAL AUDITORY PROCESSING DISORDERS

Children with CAPD are a complex heterogeneous group (Young and Protti-Patterson, 1984; Katz and Wilde, 1985; Sloan, 1986; Katz and Wilde, 1994; Bellis, 1996; DeConde Johnson *et al.*, 1997) and cannot be described by means of a single profile (Katz and Kusnierczyk, 1993, Bellis, 1996). Not all of these children manifest with *all* the symptoms and behaviours listed in literature. They differ in the degree and nature of their problems (Butler, 1980), the severity of a specific symptom, as well as the overall handicapping effects (Katz and Kusnierczyk, 1993). The most common symptoms and behaviours of children with CAPD can be listed as follows (based on the work of Rampp (1980), Keith (1988) and ASHA (1996), DeConde Johnson *et al.*, (1997)):

- Difficulty with figure-ground discrimination.
- Poor auditory attention or inconsistent response to auditory stimuli
- Short attention span and easily fatigued.
- Easily distracted by both auditory and visual stimuli.
- Limitation in memory and retrieval of auditory information.
- Poor integrative skills.
- Difficulty with localization of the source of auditory stimuli.
- Difficulty with phonics.
- Reduced ability to sequence auditory information.
- Difficulty following instructions in class or at home.

- Problem with time-altered speech.
- Poor word and sound attack skills in reading.
- Difficulty separating words into syllables or sounds.
- Poor sound blending skills.

There is also a high incidence of speech and language problems amongst children with CAPD (Katz and Wilde, 1994; Bellis, 1996; DeConde Johnson *et al.,* 1997). These language and speech related symptoms of CAPD have important implications. Egland (1970) remarks that when a child enters school, the most important skills for adjustment and learning are expressive and receptive language. This implies that the scholastic achievement of children with CAPD (especially those with language problems) is compromised due to the inability to understand what is required of them and the inability to express themselves in both verbally and by using written symbols. This highlights the need of the speech-language pathologist's intervention with some children with CAPD.

Auditory processing skills are important for academic achievement and intact auditory processing skills are essential for a child to perform well at school (especially in academic subjects related to reading and spelling abilities). Deficits in one or more of the skills will consequently manifest in poor performance in the academic sphere. Furthermore, children with CAPD appear to lack the ability to think systematically and pay attention selectively, and cannot distinguish easily between relevant and distracting information (Rampp, 1980; Bellis, 1996). They respond to all sounds as if these sounds have equal importance. Hence they become distracted and are unable to pay sustained attention (Smoski, Brunt, Tannahill, 1992). In the classroom context these children will often be seen as disruptive.

Other behaviours noted in children with CAPD include the improper integration between visual and auditory systems. Thus they find it difficult to understand the teacher when she talks and writes on the board at the same time, and struggle to listen and write simultaneously (Stach and Loiselle, 1993). Children with CAPD also appear to need extra effort in order to be able to listen carefully and concentrate properly (Crandell and

Smaldino, 1996; Kramer, Kapteyn, Festen and Kuik, 1997) especially in the presence of background noise that is typical of most classrooms.

2.3.1. Additional behaviours associated with central auditory processing disorders

Apart from the symptoms mentioned above, children with CAPD often display abnormal behaviour patterns that can co-occur with the already discussed symptoms. It must be remembered that due to the heterogeneity mentioned previously, not all children with CAPD will necessarily display one or more of the behaviours discussed below. Some of these symptoms form part of the basic condition while, others are behavioural responses that have developed because of the CAPD. The following list of related behaviour patterns are based on the work of Rampp, (1980), Katz and Wilde, (1985), Willeford and Burleigh, (1985), Katz and Kusnierczyk (1993), Stach and Loiselle, (1993) and DeConde Johnson *et al.,* (1997).

- Hypoactivity
- Hyperactivity
- Nervousness
- Disinhibition and daydreaming
- A-social behaviours
- Boredom
- Motor co-ordination and dominance problem
- Serial events and rote sequencing problems
- Low self-esteem

Children with ADHD and CAPD may present with similar behaviours. Some researchers have even suggested that they are in fact the same development disorder (Chermak *et al.,* 1999). The differences in the similar behaviours (e.g. attention deficits) displayed by children with ADHD and those with CAPD is that the deficits experienced by children with ADHD are pervasive and supramodal impacting more than one sensory modality whereas those of children with CAPD are restricted to auditory modality (Chermak *et al.,* 1999).

2.3.2 Classroom related behaviours and symptoms of children with central auditory processing disorders

Some of the observable behaviours and symptoms displayed by children with CAPD in the classroom have been reported by authors such as Rampp, (1980), Keith, (1988), Katz and Wilde, (1985) Katz and Wilde, (1994), Bellis, (1996), and DeConde Johnson *et al.*, (1997). Knowledge of these behaviours and symptoms can help the teacher to identify children with CAPD. These observable behaviours and symptoms in the educational setting are graphically presented in figure 2.1.

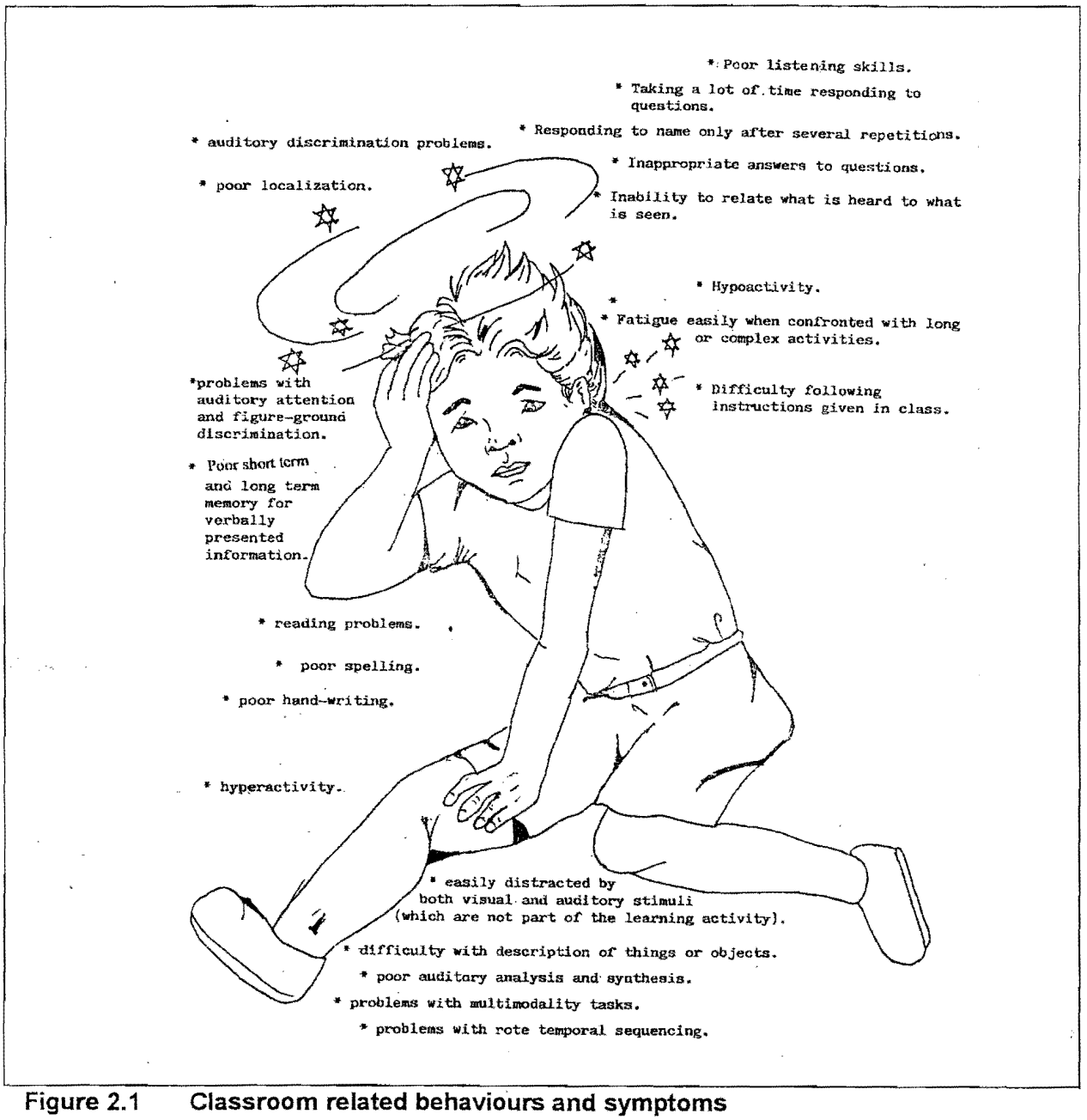

Figure 2.1 Classroom related behaviours and symptoms

Source: Compiled from Rampp, (1980); Katz and Wilde, (1985); Keith, (1988); Katz and Wilde, (1994); Bellis, (1996) and DeConde Johnson *et al.*, (1977)

2.3.3. The impact of central auditory processing disorders on schoolwork

CAPD have a negative impact on the child=s work and performance in the classroom. The performance of children with CAPD is reported to be very poor, specifically on academic subjects that involve the use of verbal language skills (Katz and Kusniesczyk, 1993; Bellis, 1996). This is a problem that generates a vicious circle - the poor self-concept that results from a multiple failure may lead the child with CAPD not to participate in classroom activities. This in turn, will have a negative effect on their ability to learn (Keith, 1988; Bellis, 1996; DeConde Johnson *et al.*, 1997). In class these children may respond inappropriately to questions, which reveals a lack of understanding of the content of the conversation or topic being discussed (Keith, 1988; Bellis, 1996; DeConde Johnson *et al.,* 1997).

Children with CAPD experience difficulty with verbal instructions that involve a multi-step directions (Rampp, 1980; Keith, 1988; Katz and Kusnierczyk, 1993; Bellis, 1996, DeConde Johnson *et al.,* 1997). This difficulty in following directions and verbal instructions often leads to the children not doing their schoolwork (Keith, 1988; Bellis, 1996). The scholastic achievement is further compromised due to reading problems, spelling difficulties and language disorders (in some of the children) (Rampp, 1980; Katz and Kusnierczyk, 1993). Hence these children tend to be labelled as a learning disabled (Rampp, 1980; Katz and Wilde, 1994; Bellis, 1996).

The ability to read and write is a basic necessity in the lives of civilized people of the world of today. It has social and communicative value and provides access to a fuller cultural life through reception of ideas, thoughts, feelings and emotions. Children with CAPD are deprived of these basic needs as a result of the communication, reading and writing deficiencies that these disorders impose on them (Katz and Wilde, 1985).

2.4. SUMMARY OF CHAPTER TWO

The etiology, behaviours and symptoms of children with CAPD have been discussed in detail in this chapter. An attempt was made to look at the child as a whole, by firstly discussing both the speech-language pathology approach and the audiology approach towards CAPD and secondly merging the two approaches in view of the fact that they both have an adverse impact on the communicative, learning and social aspects of the child.

Finally this chapter contains a brief discussion of the future implications of CAPD on children as far as workplace and social interaction are concerned. Since CAPD cannot be outgrown (Stach and Loiselle, 1993), it follows logically that they have to be managed on a long-term basis. This leads us to Chapter 3, which deals with evaluation and management of children with CAPD.

3. CHAPTER THREE:

CENTRAL AUDITORY PROCESSING DISORDERS: THE ROLE OF THE TEACHER, SPEECH-LANGUAGE PATHOLOGIST AND AUDIOLOGIST IN THE EDUCATIONAL SETTING

3.1 INTRODUCTION

Central auditory processing disorders (CAPD) constitute a multidimensional problem (Katz and Wilde, 1985; Bellis and Ferre, 1999). The complexity, nature and uniqueness of the problems displayed by children with these disorders pose a great challenge to professionals called upon to evaluate and manage this category of the population. The heterogeneity referred to in the previous chapters adds to the difficulties in terms of treatment, as each child requires a unique treatment programme tailored for his/her problems and needs. Hence, the need for a multidisciplinary approach (Bellis, 1996; Nielsen, 1997; Bellis and Ferre, 1999).

Because of the complexity of the problem and the heterogeneous nature of the affected population, a team approach could be considered appropriate in terms of intervention (Bellis, 1996; Nielsen, 1997; Sloan, 1998). Such a team - with the task to evaluate and manage children with CAPD - may include, parents, classroom teachers, speech-language pathologists and audiologists, general practitioners, remedial teachers, occupational therapists, physiotherapists, nutritionists, psychologists, paediatricians, ear, nose and throat specialists (ENTs) and neurologists (Barr, 1972; Katz and Wilde, 1985; Katz and Kuisnierczyk, 1993; Campbell, 1994; Musiek and Chermak, 1994, Bellis, 1996; Nielsen, 1997). Each of these professionals plays an important role in dealing with children with CAPD. The involvement of the team members depends on the nature and the degree of the disorder/s (Bellis, 1996; Sloan, 1998). However, in the educational setting (which is the focus of this study), the most important team member will be the teacher as it is the teacher who enforces recommendations made by other team members. Furthermore, teachers are in daily contact with these children in the classroom and can assist in helping the child overcome the difficulties associated with CAPD. Therefore the following discussion will concentrate on the role of the teachers and refer to the role of the speech-language pathologist and audiologist

against this background. As mentioned in the previous chapter, teachers are in daily contact with children. They are a source of referral in most cases and they play an important role in the intervention process aimed at children with CAPD.

The aim of this chapter is to investigate the role of the teacher as the most important member of the educational team dealing with children with central auditory processing disorders (CAPD). This will be discussed against the framework of the traditional approach towards intervention in the case of children with CAPD, namely intervention by the audiologist and the speech-language pathologist.

3.2 THE ROLE OF THE AUDIOLOGIST IN EVALUATING CHILDREN WITH CENTRAL AUDITORY PROCESSING DISORDERS

Children with CAPD generally give the impression that they are not listening, or that they do not hear or fail to understand what is said to them (Willeford, and Burleigh, 1985). Hearing (or specifically the inability to hear) is therefore often the first suspected impairment and the main reason for seeking professional assistance. This subsequently explains why an audiologist is often the first professional to see a child with a CAPD. It also explains why the audiologist is predominantly involved in the assessment of children with CAPD. According to ASHA (cited in Sloan, 1998), the best professionals to assess children affected by these disorders are the speech- language pathologists and audiologists (Sloan, 1998).

The processing of auditory information requires the integrated function of both the peripheral and central nervous system (Willeford and Burleigh, 1985; Katz and Kusnierczyk, 1993). The functional status of both these areas therefore has to be assessed when dealing with children with CAPD.

As a first step, the standard audiological battery which consists of Pure Tone Audiometry, Immitance and Speech Audiometry should be administered in a sound

proof audiological suite in which the listening environment and signal are optimal (Yantis, 1985). Testing under these conditions usually reveals that the child has normal peripheral hearing. Peripheral hearing loss and CAPD can however occur together (Jerger, 1981, in keith, 1981; Willeford and Burleigh, 1985; Katz and Kusnierczyk, 1993, Campbell, 1994). The condition under which the testing of the peripheral auditory system take place is not the ideal representation of situations where the child experiences difficulties (for example, the playground, classroom situation, home) because the tests are administered in a sound proof room. Hodgson (1982:221) stated that "testing speech in a sound-isolated environment is a totally unrepresentative of any situation anyone will ever encounter in the real world". Although this procedure does not provide much information about children with CAPD, it gives some indication that the disability is not in the peripheral auditory system. The basic test battery also provides valuable information regarding the audiometric setting for CAPD tests. Normal results obtained from the basic test battery allow the audiologist to perform a holistic and complete assessment of the entire auditory system, including the peripheral to central auditory pathways.

The so-called special tests used for assessing children with CAPD were initially used to assess adults to confirm the presence or absence of Site Of Lesion (SOL) in their Central Auditory Nervous System (CANS) for medical purposes (Kaplan, Gladstone and Katz, 1984; Willeford and Burleigh, 1985; Katz and Kusnierczyk, 1993). The auditory mechanism at various levels of the CANS is placed under a unique stress, the objective being to identify deficiencies in the CANS (Keith, 1981; Willeford and Burleigh, 1985).

There are many different ways of categorising tests of central auditory processing. They can be classified according to presentation method (ASHA, 1990), the type of stimuli utilized (Katz, 1994) and the redundancy (low or high) of the auditory signal (Bellis, 1996). Baran and Musiek (1991 cited by Bellis, 1996) divided central tests into two broad categories, namely, behavioural and electro-physiological procedures. For the sake of clarity and simplicity, Baran and Musiek (1991, cited in Bellis, 1996) classification will be followed to present a summary of tests of each category and the skills evaluated in the test. This is presented in Tables 3.1 and 3.2.

3.2.1 Behavioural Tests In Audiological Assessment

Tests in this category require the child's active participation, as the child is required to respond in a particular way to the stimuli. The results of the tests are based on the behaviours displayed by the child. They include dichotic speech tests, temporal ordering tasks, monaural low-redundancy speech tests and binaural interaction tests (Katz and Wilde, 1985; Katz and Wilde, 1994; Bellis, 1996; DeConde Johnson *et al.,* 1997). The examples of these behavioural measures are summarized in Table 3.1. The recommended test battery is one test from each category with the exception of Dichotic tests where it is recommended that one linguistically-loaded and one linguistically non-loaded test be included (Bellis, 1996). The South African Taskforce on CAPD is using these guidelines in the development of CAPD tests for South Africa (SASLHA, 2001).

Table 3.1 Summary of Behavioural measures based on the work of Bellis (1996)

Categories of test	Examples of test	Processes assessed
Monaural Low Redundancy Speech tests	Low-Pass Filtered Speech, Time Compressed Speech, Time Compressed plus reverberation, Synthetic Sentence Identification Test with Ipsilateral Competing Message and Speech-in-Noise.	Auditory Closure
Dichotic tests	Dichotic Digits, Dichotic Consonants-Vowels, Staggered Spondaic Word Test, Synthetic Sentence Identification Test With Contralateral Competing Message, Dichotic Sentence Identification Test and Dichotic Rhyme.	Binaural integration and binaural separation.
Temporal Tests	Frequency Patterns, Duration Patterns and Psychoacoustic Pattern Discrimination Tests.	Frequency discrimination, temporal ordering, linguistic labelling, duration discrimination and temporal discrimination.
Binaural Interaction Tests	Rapidly Alternating Speech Perception, Binaural Fusion (Band-Pass Filtered and Consonant-Vowel-Consonants) and Interaural Just Noticeable Differences.	Binaural interaction.

On an academic level, the results obtained from the different test categories were combined and interpreted. The deficits manifested gave rise to sub-profiles of CAPD (e.g. Auditory Decoding Deficit, Integration Deficit, Associative Deficit, Output-Organization Deficit, Prosodic deficit) (Bellis, 1996). The sub-profiles in turn, assisted

in planning a management programme that was deficit specific. The results are linked to place of lesion, academic difficulties and guidelines for management.

3.2.2 Electrophysiological Tests

These groups of tests are reported to be objective and believed to be free from contamination influences, such as fatigue, subject co-operation, that may affect the behavioural measures (Jerger and Jerger, 1976; Keith, 1981; Willeford and Burleigh, 1985; ASHA, 1990; Katz and Kusnierczyk, 1993). The test battery includes Auditory Reflex and Auditory Evoked Potentials. The audiologist has to bear in mind that neural responses to puretones can be poor predictors of the response to complex stimuli (Brugge, 1975 in Willeford and Burleigh, 1985). The selected electro-physiolocal tests are summarized in Table 3.2.

Table 3.2 Summary of Selected Electrophysiological Tests

Tests	Skill(s) Assessed	Sensitive to
ABR (Auditory Brainstem Response)	Binaural separation	Retrocochlear disorders, low brainstem lesions.
MMN (Mismatched Negativity)	Auditory discrimination,	Primary auditory cortex lesion, supra-temporal plane and temporal cortex lesions.
MLR (Middle Latency Response)	Word recognition, auditory discrimination and figure-ground perception, auditory-visual perception, auditory attention, auditory-visual integration and auditory sequencing.	Temporal lobe lesions, thalamocortical projections lesions, midbrain lesions.
LEP (Late Evoked Potentials)	Auditory integration and attention.	Limbic system, auditory cortex.
P300	Auditory attention and discrimination, memory, semantics, sequencing.	Multiple subcortical sites, limbic system (Hyppocampus), auditory cortex, frontal cortex, centro-parietal cortex.
Otoacoustic emissions (OAE)	Auditory attention skills and analysis of complex signals.	Outer hair cells in the cochlear.

The tests discussed in Tables 3.1 and 3.2 are among others considered very useful to evaluate children with CAPD. It is however extremely important to remember that these tests are not to be used in isolation but as part of a test battery. There is no single test that is comprehensive enough to diagnose or distinguish CAPD (Young and Protti-Patterson, 1984; Bellis, 1996; Sloan, 1998). Furthermore, some children with CAPD

have been reported to perform well or fail in some of the tests whereas have failed or passed all the other tests (Rintelman, 1985; Willeford and Burleigh, 1985; Bellis, 1996; Nielsen, 1997).

Hence the use of a number of tests combined in a specific battery. Due to difficulty in distinguishing a primary message from competing messages, difficulty in the storage and retrieval of auditory information, the inability to attend to meaningful messages in the presence of noise and difficulty with the synthesis of auditory information, children with CAPD can be expected to perform poorly in the above-mentioned tests.

In the case of children with CAPD in the classroom, these special tests referred to above are usually applied only after the child has failed the screening tests done by the teachers (using the checklists or list of behaviours). The test selection focuses on the main complaints of the referring agent and the nature of CAPD while bearing in mind the age of the child (DeConde Johnson, Benson, and Seaton, 1997). This fact emphazises the important role of the teacher as part of the rehabilitation team in providing the audiologist with information about the child's problems. Such information helps to establish guidelines to be followed for a detail assessment, diagnosis and appropriate management.

3.2.3 The role of the audiologist in the management of children with central auditory processing disorders

The main concern of an audiologist in the management of children with CAPD is to enhance the auditory signal which results in improved listening environment as well as the teaching of compensatory strategies that facilitate overcoming residual dysfunction and maximise the use of auditory information (ASHA, 1996; Bellis, 1996; Sloan, 1998; Stach, 1998). The audiologist achieve this by utilizing Assistive Listening Devices (ALD) and employing strategies and techniques that enhance the acoustic signal and increase the scope and control of language resources (Katz and Kusnierczyk, 1993; Lewis, 1994; AJA, 1996; Noe, Davidson and Mishler, 1997). These Assistive Listening Devices should be thoroughly evaluated by an audiologist, first to determine which children are candidates for these devices since not all children need them, and

secondly to ensure optimal fitting and minimize possible detrimental effects (ASHA, 1996).

To enhance the acoustic signal, the acoustic environment (for example classrooms) should have appropriate combination of reflective, absorptive and diffusive materials (Berg, Blair and Benson, 1996; Sloan, 1998). The technique of using different types of materials is referred to as Signal Control Without Amplification. The use of Individual Amplification and Sound Field Amplification system and Noise Control are very important for maximum benefit of students under poor acoustical conditions (Katz and Wilde, 1985; 1994; Berg *et al.,* 1996; Palmer, 1997).

Some of the rehabilitation strategies that have traditionally been used for the hearing impaired population can also be used for children with CAPD (Sloan, 1998) especially those children with Auditory Decoding Deficits (Bellis, 1996). Remedial reading and the augmentation of auditory stimuli with visual stimuli are also helpful to some children with CAPD. Remediation strategies recommended should be deficit-specific, as some children (those with Integration Deficits) will benefit from a discontinuation or limitation of the use of multimodality cues (Bellis, 1996; Katz and Wilde, 1994). Desensitization to noise has been found to be a useful strategy in improving the ability to tolerate background noise and improving understanding of speech in noisy environments (Katz and Wilde, 1994). In this speech-in-noise training, the introduction of noise is always preceded by relaxation (Katz and Wilde, 1994).

Reinforcement and counselling constitute an integral part of the remediation process of children with CAPD. It is important to educate and make the child aware of his/her auditory processing problems (Bellis, 1996; Sloan, 1998), as this will help the child to recognize unfavourable listening conditions and to know which strategies to apply in order to overcome/cope in such adverse situations (Katz and Wilde, 1994; Bellis, 1996; Sloan, 1998).

3.3 THE ROLE OF THE SPEECH-LANGUAGE PATHOLOGIST IN EVALUATING CHILDREN WITH CENTRAL AUDITORY PROCESSING DISORDERS

The speech-language pathology approach views CAPD as a deficiency in basic linguistic skills (Keith, 1981; Katz and Wilde, 1985; Willeford and Burleigh, 1985; Sloan, 1986; Stach, 1993). It is based on the assumption that if discrete elements of language behaviour can be identified, measured and found defective they can be treated. Finding the basic weakness rather than the root cause of the deficits in the processing ability is the major concern of this approach (Rees, 1981 in Keith, 1981; Sloan, 1998).

Sub-elements of central auditory events that are important for language processing to occur, are isolated and evaluated by the use of different speech-language tests. Auditory descriptors are used to describe specific events that are believed to take place in the process of understanding verbal stimuli so that language processes are set in motion. These events are based on the theoretical principles of language development and language use and they are therefore impossible to isolate independently and define in clinical assessment (Rees, 1981). According to Witkin (1971 in Willeford and Burleigh, 1985), many of these concepts overlap and occur in complicated simultaneous relationships. It becomes difficult to determine which event is being evaluated (Willeford and Burleigh, 1985).

The speech-language pathologist's approach is based on an analysis of the complex processing skill into simple or basic components. According to Rees (1981), Willeford and Burleigh (1985), Cline (1988), Riley, (1992), Gillet, (1993) and Sloan, (1998) the components that are thus identified and should be assessed for the purpose of remediation include following:

- Auditory discrimination
- Auditory memory
- Auditory attention
- Auditory analysis

- Auditory synthesis
- Auditory closure
- Auditory localization
- Auditory sequencing
- Auditory-visual integration.

The tests that are commonly used to evaluate these components are summarized in Table 3.3.

Table 3.3 Tests commonly used by Speech-Language Pathologists in assessing CAPD

TESTS	SKILLS/ABILITIES ASSESSED
Illinois Test of Psycholinguistic Abilities (ITPA)	Expressive speech, sequential memory, association, recognition, closure and sound blending.
Lindamood Auditory Conceptualization Test (LAC)	Speech-sound discrimination, and speech sequencing.
Goldman-Fristoe-Woodcock Auditory Skills Battery (GFWB)	Selective attention, discrimination, recognition memory, memory (for content and sequence), sound mimicry, recognition, analysis, blending, sound symbol association, reading of symbols and spelling of sounds.
Flowers-Costello Test of Central Auditory Abilities.	Selective or attentional listening.
Composite Auditory Perceptual Test (CAPT)	Attention, selective attention, memory, discrimination and sequencing.
Detroit Test of Learning Aptitude	Auditory and visual perception, auditory sequential memory, association, recognition, closure and sound blending.
Auditory Discrimination Test (ADT)	Phoneme discrimination.
Differentiation of Auditory Perceptual Skills Test	Auditory discrimination of phonemes and words.
Test of Auditory Perceptual Skills	Digit span, memory (for words and sentences), word discrimination and dictation.
Carrow Auditory Visual Abilities Test	General auditory memory (for related and unrelated stimuli), auditory sequencing, short-term auditory memory, digit span repetition (forward-reversed), auditory discrimination, word and sentence repetition, auditory blending and auditory-visual integration abilities.
Token Test for Children	Receptive language and understanding of verbal instructions (long and complex instructions).
Auditory Sequential Memory Test (ASMT)	Auditory memory and auditory sequencing.
Woodcock-Johnson Psychoeducational Battery - Revised.	Auditory perceptual abilities and academic achievement.
Tests of Written Language Ability (Clinical Evaluation of Language Fundamentals - Revised).	Phonemic representation, word attack, reading comprehension.

The tests used by the speech-language pathologist to assess children with CAPD need not be administered in a sound proof booth, but in a quiet controlled environment (DeConde Johnson *et al.*, 1997). Like the special audiometric tests, they are usually administered after the child has displayed difficulties in specific areas of auditory processing (often revealed by the screening tests or list of behaviours used by the teachers). Again, the nature of the CAPD, the child's age, concentration/attention span, motivation and the use of both verbal and non-verbal test stimuli should be taken into consideration (DeConde Johnson *et al.*, 1997).

3.3.1. The role of the speech-language pathologist in the management of children with central auditory processing disorders

In the management of children with CAPD the speech-language pathologist focuses on improving language ability and language-based auditory processing skills (Rees, 1986; Rampp, 1980; DeConde *et al,* 1997). Compensatory strategies and techniques are therefore used to enhance the child's language resources (Rampp, 1980; Bellis, 1996; DeConde *et al*, 1997). The clinician makes the child aware of the problem and increases the child's attention to acoustic properties of speech (ASLHA, 1996; DeConde *et al.,* 1997; Sloan; 1998). Activities such as skill building and repeated practise of the skill are beneficial to the child with a CAPD. Children with CAPD need structured environment, consistancy and routine. The strategies used for remediation should therefore be consistant to avoid confusion. It is also important to concretize information as children with CAPD have problems with abstract information (Rampp, 1980).

If a child has multiple defective skills, the clinician should target one skill at a time and target another only after the child has mastered the first targeted skill. The clinician has to facilitate the use of remediated skills, extended grammar and forms of speech that the child learned. This should be done in such a way that the child uses his/her knowledge of language and speech reliably and automatically (ASLHA, 1996). Furthermore visual stimuli should accompany oral stimuli. Clearly articulated slow speech, accompanied by gestures should be used when remediating children with CAPD (Rampp, 1980; Bellis, 1996; Sloan, 1998).

It is of vital importance that the child, as well as the parents, teachers and people surrounding the child be made aware and educated about his/her language problems and how they impact on his/her communication, learning and academic progress (Bellis, 1996; Sloan, 1998). Insight into the problem facilitates the remediation process, as the child and people around him/her contribute in respect of the planning of the remediation programme (Bellis, 1996; Sloan, 1998).

The speech-language pathologist focuses on improving receptive and expressive language abilities, depending on the specific type of CAPD. Training on suprasegmental aspects of speech and pragmatics, as well as metalinguistics/metacognitive strategies is very important for enchancing auditory comprehension and memory. Sufficient exposure to and experience of the rules of language will enable the child to recognize and retrieve the targeted language structures or skills and be able to use them automatically in all communicative contexts. The systematic use of multisensory rule-based approach to language and learning is reported to be of benefit to children with CAPD, especially those with Auditory Associative Deficits.

All children with CAPD need to be trained on monitoring their comprehension. The child is not allowed to guess but is encouraged to ask for repetition if s/he is unable to recall the stimulus in order to be sure of what has been said. This places the responsibility of learning and understanding on the child him-/herself (Sloan, 1998).

Strategies such as chunking or grouping and clustering, using meaning or association, are also appropriate in enhancing memory (Sloan, 1998). To facilitate retention and recalling, older children with CAPD could be trained on using crib sheets or notation devices, outlining and summarizing information (Sloan, 1998).

As mentioned previously, counselling still plays an important role in speech-language intervention of children with CAPD, as they also display social and emotional problem (Bellis, 1996; Sloan, 1998). Children who present with deep emotional and social problems should be referred to the psychologist.

3.4 THE ROLE OF THE SPEECH-LANGUAGE PATHOLOGIST AND AUDIOLOGIST AS PART OF THE EDUCATIONAL TEAM

As discussed previously, the different roles of the audiologist and the speech-language pathologist can best be seen in their different approaches to the evaluation of children with CAPD. However, their roles are also evident in the total intervention process. This is illustrated in figure 3.1.

THE AUDIOLOGIST	THE SPEECH-LANGUAGE PATHOLOGIST
HEARING ASSESSMENT: Entire auditory system. Peripheral and central auditory nervous system to rule out the presence of hearing loss and identify the defective auditory mechanisms and processes.	**SPEECH AND LANGUAGE ASSESSMENT:** Speech abilities, receptive and expressive language abilities to identify and measure the defective basic linguistic skills as well as linguistically dependent skills.
DIAGNOSIS: Defining the nature of auditory processing disorders and gives it a category/sub-profile. Report writing.	**DIAGNOSIS:** Defining the nature of auditory processing disorders and gives it a category/sub-profile. Report writing.
MANAGEMENT: Modification of classroom environment, use of assistive listening devices e.g. FM system and sound control devices. Awareness and education regarding the disorder. Counselling and refer to other team members when necessary.	**MANAGEMENT:** Speech and language therapy teaching the rules of language. Training on compensatory strategies. Awareness and education regarding disorder. Counselling and refer to other team members when necessary. Encourage and support other team members.
COLLABORATION WITH OTHER TEAM MEMBERS: To provide a holistic and integrated approach in the management of CAPD in children. **TRAINING OF TEACHERS:** This should include: - sharing of knowledge of CAPD and implications of CAPD - training in early identification using checklists - training in making of appropriate referrals - training in modifications in the classroom including assestive listening devices - monitoring of child's progress - training in importance of ongoing collaboration with speech-language pathologists and audiologists and other team members	

Figure 3.1: The different roles of the audiologist and speech-language pathologist in intervention with children with central auditory processing disorders

In South Africa the audiologists and speech-language pathologists (because they have traditionally been trained in this field) have a great responsibility of educating parents,

teachers and education authorities (especially among black communities) to meeting the unique needs of children with CAPD. The government, in consultation with Professional Boards, has to be sensitive to the needs of this group (Medwetsky, 1994; NCESS, 1997; Boland, Cann, McCuaig and Onslow, 1998; Fletcher, 1998) and employ professionals who will ensure that the communicative, social and learning aspects of children with CAPD are maximized in order to meet their educational and real life capabilities (Medwetsky, 1994; NCESS, 1997).

Parents of children with CAPD get frustrated as they do not know what to do with these children. The audiologists and speech-language pathologists have a responsibility of discussing the child's problems with them and making suggestions on how to overcome or cope with the problem. For emotional support, the audiologist and speech-language pathologist can form a support group consisting of parents, siblings or any family members of children with CAPD (Bellis, 1996; Nielsen, 1997). It is the responsibility of the audiologist and speech-language pathologist to listen carefully to the concerns and needs of the group. The audiologist and speech-language pathologist should continue to support the group by giving them new information about the disorder and acts as a facilitator. The speech-language pathologist and audiologist - as the leader of the project when dealing with CAPD - should be more educated in the matters relating to the disorder in order to pass on appropriate and relevant information to teachers to ensure the desired results (Bellis, 1996; Nielsen, 1997).

It is the responsibility of the speech-language pathologist and audiologist to provide guidance to teachers relating to strategies used in assisting a child with a CAPD (Katz and Wilde, 1994; Bellis, 1996; Nielsen, 1997).

The speech-language pathologist and audiologist also have to train teachers about CAPD and the implications that these have for the child's learning. Teachers need to know when and where to refer a child with a CAPD. As the speech-language pathologist and audiologist is most involved in the implementation of management of children with CAPD (Bellis, 1996; Sloan, 1998), it is his/her responsibility to give guidelines for classroom modification and the use of compensatory strategies. In order

for teachers to get involved in the management process of children with CAPD, the speech-language pathologist and audiologist needs to highlight the importance and benefits of these strategies. Furthermore, the speech-language pathologist and audiologist need to offer lots of support and encouragement to the teachers during the process of managing children with CAPD (Bellis, 1996).

3.5 THE ROLE OF THE TEACHER AS A TEAM MEMBER IN PROVIDING A SERVICE TO CHILDREN WITH CENTRAL AUDITORY PROCESSING DISORDERS

According to NCESS (1997:iv) a teacher is "a person who educate others at all levels of education in any type of education or training context, including formal and informal". Teachers instruct children and work together with other professionals in identifying and referring children with possible disabilities requiring further assessment and management (Bellis, 1996). The teacher also has an important role in managing children with disabilities in the classroom. In S.A. the emphases is on mainstreaming (NCESS, 1997).

Below-average school performance of children with CAPD is the main reason for seeking professional assistance (Smoski, Brunt and Tannahill, 1992). The clinical impression is that children do not outgrow the disorder, however, they appear to develop compensatory skills as they get older (Stach and Loiselle, 1993). Parents and teachers are usually the first people to notice the child's problems. Useful information regarding the child and the child's problems can be gathered from them even before assessing the child (Giliomee, 1995; Bellis, 1996).

Although there is an overlap in some of the roles played by the audiologist, parents and teachers, the latter play an important role in identifying and remediating children with CAPD, as they are the ones who enforce the roles played by other team members. As mentioned previously, teachers are in daily contact with children and CAPD has a greater impact in the academic sphere. A teacher who has acquired a specialized knowledge on CAPD (Moodley, 1999), will be motivated to put the theory of management of CAPD into practise. According to Moodley (1999) specialized

knowledge is the knowledge above the basic knowledge provided by specific disciplines and it produces better understanding of the theoretical and practical part of the subject. Therefore, imparting knowledge regarding CAPD to teachers will result in them becoming aware of the nature of CAPD and the unique needs of children with CAPD (Bellis, 1996; Jerger, 1998). The team members that may be involved in the management of a child with CAPD is presented in figure 3.2. The cardinal central role of the teacher is highlighted in this figure.

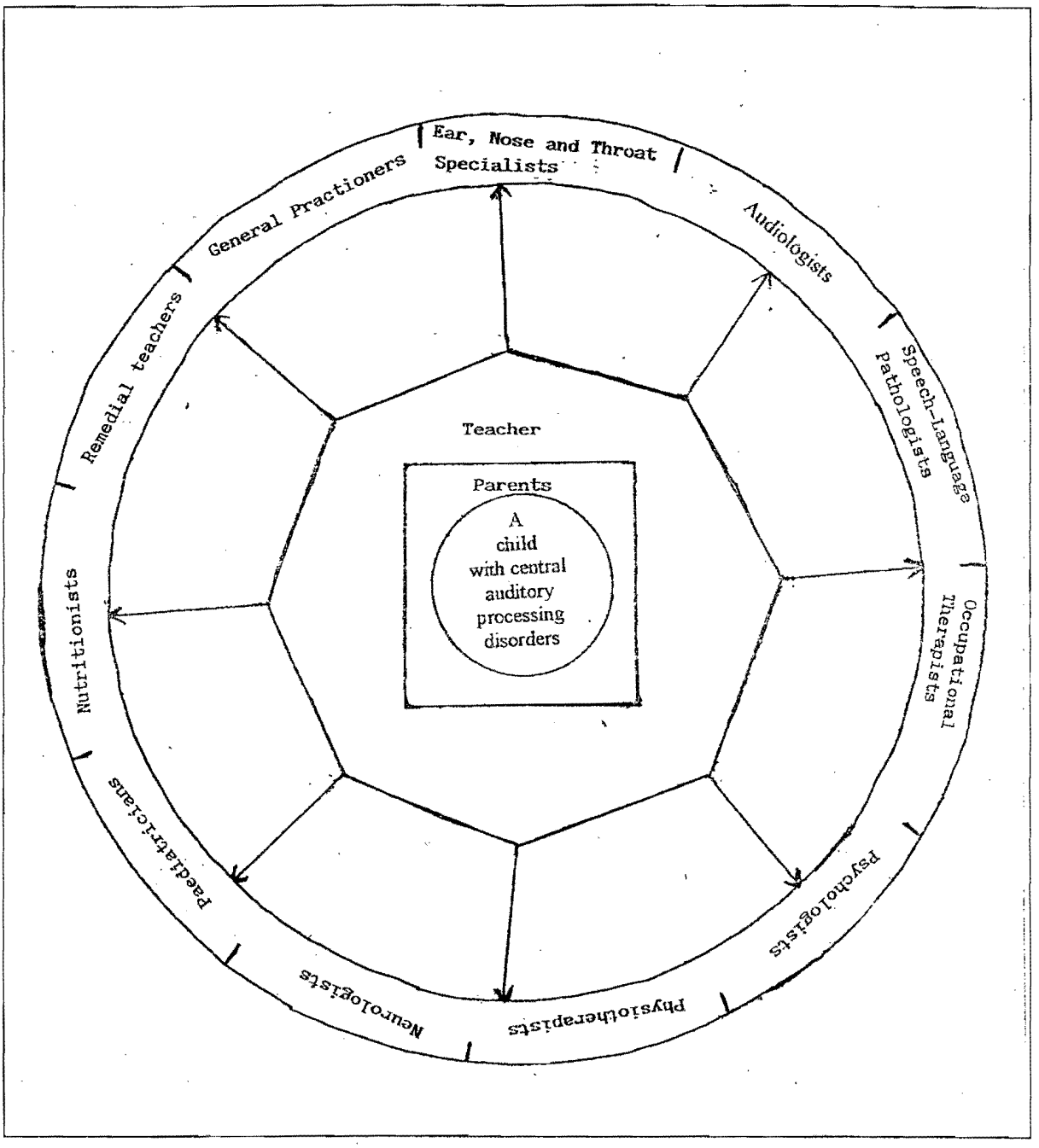

Figure 3.2: Professionals involved in management of children with central auditory processing disorders and the role of the teacher in terms of referring (presented by arrows) children in need of the specialists' assistance.

Sourse: (Developed based on information from Barr, (1972); Rampp, (1980); Katz and Wilde, (1985); Katz and Kusnierczyk, (1993); Campbell, (1944); Musiek and Chermak, (1994) and Bellis, (1996)).

The relationship between the child, parents and teachers is a very close one. Parents and teachers have daily contact with the child and they are usually the first people to notice the child's problems. The arrows surrounding the teacher leading to different directions highlight the role that teachers play as sources of referral to different professionals. In other words, teachers have access to different professionals after having identified a problem in a child. They can subsequently refer a child for a detailed assessment, appropriate diagnosis and management. The other team members work closely with the teacher in terms of identification and management of children with disorders. In the case of children with CAPD, the speech-language pathologist and audiologist will need to work closely with the teacher and then with other team members (Fletcher, 1998; Boland *et al.*, 1998).

Teachers are in contact with children on a daily basis and they are therefore key persons for identifying and referring children who need the assistance of specialists (Giliomee, 1995; Bellis, 1996) (illustrated in Figure 3.2.). Thus it is clear that teachers need to be trained in identifying and assisting children with CAPD in order to know when and where to refer a child with these disorders. Referring a child to the appropriate professional, will save time and money and result in early intervention. It will also relieve parents from the anxiety of not knowing what is wrong with their child as the speech-language pathologist and audiologist will counsel them (Jerger, 1998) and educate them about the child's problem.

The process of integrating children with disorders and disabilities into mainstream schools mentioned previously, poses a formidable challenge to teachers as the number of children per classroom will increase and therefore also the number of children with CAPD, will increase steadily (Giliomee, 1995; NCESS, 1997). Teachers must therefore be empowered NCESS, 1997) to handle these children. The specific role of the teacher is clearly indicated in figure 3.3.

Although the literature provides some information on the role of the teachers regarding CAPD (Bellis, 1996; DeConde Johnson, *et al.,* 1997), these discussions tend to be superficial and only refer briefly to identifying and referring, with general guidelines that

can be given to the teacher for managing the child in the class. It is important to recognise the very important role, which the teacher has to play in the management of CAPD.

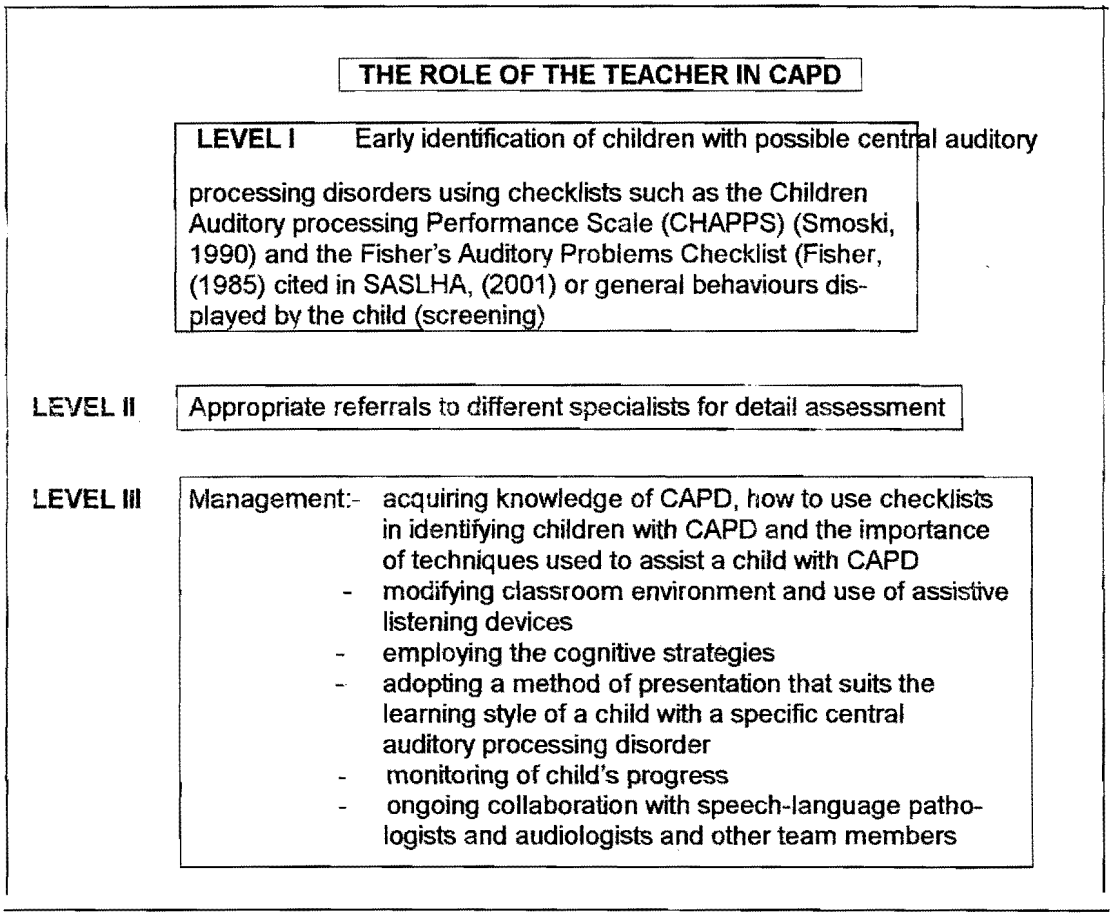

Figure 3.3. The role of the teacher in the management of children with central auditory processing disorders

As seen in **figure 3.3**. the role of the teacher outlined above can be divided into three different levels:-.

- Level I involves the identification and screening of children with CAPD
- Level II is concerned with the referral and detail assessment of children with CAPD (proper diagnosis).
- Level III has to do with planning of management procedures. This includes the ongoing assessments and other issues/concerns that may arise during the management process.

3.5.1 LEVEL I: TEACHER'S ROLE IN SCREENING CHILDREN WITH CENTRAL AUDITORY PROCESSING DISORDERS

Teachers should screen children with CAPD by using a list of general behaviours displayed by this population group or by using checklists (Richard and Hanner, 1990) such as those mentioned in **Figure 3.3** for identification purposes. This procedure is time and cost effective, as the speech-language pathologists and audiologists only have to focus on detail assessment, appropriate referrals and monitoring remediation suggestions (Medwetsky, 1994).

3.5.2 LEVEL II: TEACHER'S ROLE IN REFERRAL OF CHILDREN WITH CENTRAL AUDITORY PROCESSING DISORDERS - IMPLICATIONS FOR TEACHERS TRAINING

As discussed previously, teachers have access to different professionals. Any child who displays some difficulties or strange/abnormal behaviours should be referred for detail assessment and management. Children with CAPD should be referred to the speech-language pathologist and audiologist as they may present as having a hearing loss or learning disabilities. The teacher's role in this process is first to act as a referral agent. Additionally, the teacher must also provide the diagnostician with information about the child's functioning in the classroom, which will enhance the diagnostic process.

3.5.3. LEVEL III: THE TEACHER'S ROLE IN MANAGEMENT OF CHILDREN WITH CENTRAL AUDITORY PROCESSING DISORDERS - IMPLICATIONS FOR TEACHER'S TRAINING

As a first step in management, teachers as referring agents, can also help in counselling parents of children with CAPD as they have easier access to them compared to other professionals.

Teacher can furthermore impart knowledge received from other team members regarding CAPD and the management thereof. This will facilitate the formation of support groups and it will empower parents with knowledge that will eventually smooth progress of the total management process (Fletcher, 1998; Boland *et al.*, 1998).

Although teachers are not directly involved in the diagnostic process, they play an important role in monitoring the classroom-based strategies and techniques suggested to help in remediation of CAPD (Bellis, 1996). They must therefore have knowledge and an understanding of general characteristics of children with these disorders and their educational impact. It is also important for teachers to understand the rationale behind the implementation of each classroom-based method and compensatory strategies used in the management of CAPD (Bellis, 1996). Having insight into the method used in remediation will motivate them to provide an environment that is conducive to learning for these children and to carry out suggestions made by other team members.

The following guidelines and techniques are among others that can be employed by teachers in an attempt to help children with CAPD.

- **Classroom placement and preferential seating**

  The child should preferably sit in the front row in order to get maximum visual cues or even lip read if possible (Willeford and Burleigh, 1985; Stach and Loiselle, 1993; Campbell, 1994; Bellis, 1996; NCESS, 1997; Sloan, 1998).

- **Structured environment**

  Children with CAPD prefer self-contained structured environment (Katz and Wilde, 1985; Bellis, 1996; NCESS, 1997). Thus teachers are advised to avoid an open unstructured environment when dealing with these children.

- **Acoustical control and visual aids**

  It is important to supplement the auditory message with visual input to help the child to retain new learning. Reduction of noise by getting rid of noise generating objects greatly benefits children with CAPD (Young and Protti-Patterson, 1984; Katz and Wilde, 1985; Crandell and Smaldino, 1996; Bellis, 1996; Bench and Maule, 1997; Sloan, 1998).

- **Modification of listening environment**

  Increasing clarity of the primary spoken message by improving signal-to-noise (S/N) ratio can be obtained by using heavy materials, soft porous materials, bookshelves, acoustic tiles, carpets, bulletin boards and wall hangings to furnish the room. These objects and materials are reported to exclude sound and will reduce and absorb reverberation (Katz and Wilde, 1985; Campbell, 1994; Berg et al., 1996; Bellis, 1996; Sloan, 1998).

- **Quiet study area**

  This area should be away from visual and auditory distraction (Katz and Wilde, 1985; Stach, Loiselle, 1993; Bellis, 1996).

- **Frequency Modulated (FM) system/Loop FM System/Infrared System**

  This system is reported to be helpful in the reducing background noise, enhancing the primary signal, reducing emotional outburst in the classroom, and in improving assignments as well as the quality of overall classroom performance (Stach, 1993; Stach and Loiselle, 1993, Campbell, 1994; Lewis, 1994; Crandell and Smaldino, 1996; Bellis, 1996; Palmer, 1997). The problem is that not all children can afford to have such a system as it is expensive and is only suitable for children who do not have language problems.

- **Sound control devices**

  Earmuffs or earplugs are reported to have produced satisfactory results when applied to children with CAPD that result from the dysfunction of the auditory mechanism and processes. Both ears or only the weak ear can be occluded in order to reduce the ambient noise that interferes with important academic tasks. Unfortunately bilateral occlusion is recommended during desk-activities only, when concentration is important (Willeford and Burleigh, 1985).

- **Improvement of communication. Suggestions for strategies that will achieve better communication in the classroom**

  Gain the child's attention before giving instructions. This can be done by calling the child's name or by touching him gently (Lasky and Cox, 1983; Katz and Wilde, 1985; Cline, 1988).

  Monitoring comprehension by asking the child questions related to the subject being discussed (Cline, 1988; Richard and Hanner, 1990; Bellis, 1996; Sloan, 1998).

  Rephrasing/Repetition of the misunderstood information by reducing linguistic complexity of the statements as well as the vocabulary level (Katz and Wilde, 1985; Cline, 1988; Bellis, 1996).

  Use brief instructions to help with memory and decoding (Bellis, 1996).

  Pretutoring. This involves familiarizing the child beforehand with new vocabulary and concepts to be covered in class (Katz and Wilde, 1985; Bellis, 1996).

  Listing key vocabulary words of new materials on the chalkboard before discussion. Writing down instructions also benefits children with CAPD (Cline, 1988; Bellis, 1996).

  One-to-one tutoring helps with filling in the gaps in the child's understanding (Katz and Wilde, 1985; Bellis, 1996).

  Providing breaks helps to reduce frustration as children with CAPD fatigue easily (Katz and Wilde, 1985).

  "Mindmapping" and mnemonic devices are reported to be useful (Campbell, 1994) and may be motivating to the child.

  Frequent check of comprehension by asking the child to paraphrase or act what has been said (Richard and Hanner, 1990; Bellis, 1996).

  Provide a note taker or allowing the child to tape record the lesson in order to avoid divided attention and concentration in children with CAPD (Bellis, 1996; Sloan 1998).

Truesdale (1990) emphasizes the importance of teaching the child that listening is an active behaviour. *The whole body should take part in the listening process.* The child has to be taught to listen with the whole body by sitting still, being quiet, concentrating

on the speaker, thinking of and paying attention to what is being said. Teachers should train children on "Whole-body" listening skills (Truesdale, 1990). Since the "whole body" is participating actively in listening, the child should think about listening and pay attention to the sounds that are presented orally, as this will promote spelling and reading abilities (Truesdale, 1990). Teachers should concretize listening by using body parts, by asking children to complete the missing sound in a word presented orally or by identifying a tape recorded sound or by sequencing directions that were presented verbally (Truesdale, 1990).

The strategies and techniques discussed above have been devised to improve the child's academic performance and communication. This should be combined with modification of the child's environment.

To ensure that children with CAPD are given opportunity to reach their full academic potential, teachers need to be empowered to identify and manage such children. As mentioned previously, children with CAPD are mistakenly regarded by teachers as having hearing loss. Teachers in mainstream schools consider themselves not capable of teaching children with hearing losses, with the results that they recommend them to be placed in schools for the deaf. This reveals their lack of knowledge of CAPD. Collaboration between the Department of Health and the Department of Education is of vital importance in order to enhance the teacher's knowledge of issues regarding CAPD. Speech-language pathologists and audiologists and teachers need to work together in order to benefit children with CAPD. A sound relationship between all the stakeholders will facilitate the integration process. Teachers will be aware of disorders that impede on children's academic performance and that can be eradicated with special assistance, while children can be taught to cope by utilizing certain strategies and techniques.

3.6 SUMMARY OF CHAPTER THREE

Chapter 3 discusses the role of the speech-language pathologist and audiologist in terms of the evaluation and management of children with CAPD. Different speech-

language and audiological tests that are used to assess such children were briefly summarized. The role and the importance of the teacher in the intervention process have been highlighted in this chapter, while techniques and strategies that can improve academic performance, communicative and social abilities of this population group also received attention.

4. CHAPTER 4: METHODOLOGY

4.1 INTRODUCTION

The segregation policies of South Africa have had a great impact on children with disorders and disabilities among the black communities (NCESS, 1997). Aspects such as lack of exposure, limited resources, inflexible curriculum and rigid teaching style have led to the marginalization of children with CAPD (NCESS, 1997). This resulted in either late or even lack of identification of such children. The lack of proper and efficient intervention at an early school going age has led to high rate of school dropouts and it is suggested that children with CAPD may form part of this group. According to the NCESS (1997), it is difficult to give an accurate number of school dropouts, however it can be accepted that many children with disorders did not have access to the formal education system.

The literature review in Chapter one highlighted CAPD as one of the most disabling disorders that can affect a child=s academic, social and communicative life (Rampp, 1980; Keith, 1988; Bellis, 1996; Bench and Maule, 1997). Clinical experience suggests that teachers seem not to understand children with CAPD. These children are often mistakenly considered by teachers as having hearing difficulties, being "naughty" or being learning disabled. The aim of this research is to assess the training and knowledge of primary school teachers in urban black schools regarding CAPD.

As education is considered a fundamental right to everybody in South Africa (NCESS, 1997), the integration process highlights the need for research to determine if teachers in the mainstream schools are adequately qualified or prepared to handle children with disabilities/disorders. In Chapter one it was mentioned that limited research related to CAPD and academic difficulties has been done in South Africa, especially among black communities. This kind of research is very important in order to ensure that future planning and development will take the specific needs of children with disabilities into

account.

The fact that teachers are core team members involved in the identification, referral and remediation of children with CAPD (Willeford Burleigh, 1985; Bellis, 1996) highlights the need for research in this area. Research is an important step in order to ensure the development of teachers' capabilities and preparedness to deal with children with CAPD.

Finally, research is a method of obtaining answers to unresolved problems and the discovery of new facts (Leedy, 1993). The information derived from this research will increase the knowledge of speech-language pathologists and audiologists regarding the training and knowledge of teachers in areas of CAPD and probably increase the exposure of the profession and facilitate collaboration between teachers and speech-language pathologists and audiologists (Fletcher, 1998).

The title of this study indicates that this project aims to investigate the knowledge of urban black teachers regarding CAPD. The results of this study will be analysed and interpreted to gain insight into the knowledge of teachers in the black communities.

In the previous chapters, a review of the literature has been provided and the aim and rationale underlying the study have been presented. According to Leedy (1989) and Mitchell and Jolley (1992), research originates with a question that is divided into manageable sub-aims. The question should have clear goals and requires a specific plan of procedure (Leedy, 1993). This chapter will chronicle this process.

The present chapter aims at describing the research aims and methodology needed to answer the question "What is the training and knowledge of primary school teachers in urban black schools pertaining to auditory processing disorders?". This will be translated into research design, subjects specification, material for data collection and procedures, and finally, data analysis.

(The format used in some of the sections of this chapter is based on the dissertation of Moodley (1999))

4.2 RESEARCH AIMS

The aim of this study is to assess the training and knowledge of primary school teachers in urban black schools regarding CAPD. In order to realize this aim, the following sub-aims were developed:

- **First sub-aim**

To establish whether teachers have received training in respect of CAPD, and if they have, what the level (at which stage training was received) and extent (what this entailed) of this training was.

The information that answers the question posed by this sub-aim is contained in Section D of the questionnaire (Appendix III).

- **Second sub-aim**

To describe teachers' knowledge of the characteristics and causes of CAPD. Section B of the questionnaire was utilized to obtain information in this regard.

- **Third sub-aim**

To determine the teachers' knowledge of the team members involved with children with CAPD. Information obtained by means of Section C of the questionnaire related to this sub-aim.

The ***level*** and ***extent*** of training referred to in sub-aim one refers to the teaching qualification of the teacher as well as the highest qualification or level of study. The second and third sub-aims both were related to the teacher's knowledge of CAPD but were provided as separate sub-aims as sub-aim two focussed on CAPD as a field while sub-aim three focussed on the team and role of the teacher. The terms "knowledge" and "training" are defined under 1.3.

4.3 RESEARCH DESIGN

A descriptive survey was conducted to explore the training background and knowledge of black teachers in mainstream primary schools in Soweto as far as CAPD are concerned. The opinion of the targeted population was determined by using a questionnaire. The descriptive survey method was employed as it is appropriate for data derived from questionnaires (Leedy, 1980; Mitchell and Jolley, 1992).

4.4 SUBJECTS

The subjects or respondents included in the study will be discussed in terms of subject selection criteria, subject selection procedure and a description of the subjects.

4.4.1 Selection criteria

Subjects were selected in terms of the following criteria:

4.4.1.1 Teachers from an urban black community

This study chose to investigate training and knowledge of black teachers in mainstream primary schools in Soweto. Soweto is a conglomeration of townships located south-west of Johannesburg (Turton, 1986; Bonner and Segal, 1998). Like all other black townships it is made up of people of different ethnic groups with differing interests, backgrounds and languages and is thus representative of the urban black population of South Africa.

Previously, under the *Group Areas Act*, people in Soweto were grouped according to the languages they spoke (Bonner and Segal, 1998). In the new dispensation, however, people from different ethnic group with different languages and interests are now living together in the same location/area in mortgaged/rented houses on sites that were allocated to the private sector contractors for development. A middle class of citizens has gradually emerged from Soweto as blacks have become better educated. The adoption by American and other foreign companies operating in South Africa of the

Sullivan Code, that prohibits racial discrimination in the hiring and promotion of workers (Bonner and Segal, 1998), further contributed to the establishment of this multi-ethnical middle class. The results obtained from this study in Soweto should therefore give a true reflection of middle class black mainstream primary schools in South Africa.

Apart from its different ethnic groupings, the Soweto community was targeted for the reason that clinical experience indicated that many of the children who were referred to speech-language pathologists and audiologists with referral letters, that suggest possible hearing losses/deafness, were from schools in Soweto.

4.4.1.2 Primary school teachers

Primary school teachers were targeted since most children with CAPD manifest these disorders during the early years of schooling when early identification and management has the greatest impact (Rampp, 1980; Katz and Wilde, 1994; DeConde Johnson *et al.*, 1997). This is also the scholastic phase during which listening skills and auditory processing are expected from children (Rampp, 1980; Truedale, 1990; Katz and Wilde, 1994). The knowledgeable and skilled teacher will therefore be able to identify any children with a CAPD.

4.4.1.3 Proficiency in English

Subjects were required to be proficient in speaking, reading and writing English since the questionnaire was in English. As all teachers are expected to have passed Grade 12 prior to being trained as teachers, they are expected to be able to read, write and speak English. Because of the multiplicity of languages spoken in Soweto, the researcher decided to use English as the medium of research. It is not only the language that is most likely to be understood by all, but also the medium of instruction used at the schools.

4.4.2 Selection procedure

A process of random selection was used to identify the schools that would participate in the study. Every fourth mainstream school was selected from the list of 279 primary schools in Soweto obtained from Gauteng Department of Education. By means of this selection method 70 primary schools were identified from different areas of Soweto. The selection ensured that a large section of Soweto was covered and that different ethnic groups were included. In cases where co-operation was not forthcoming from a school or the school turned out to be junior primary schools but not lower primary schools, the next lower primary school below the selected one was included in the list of the targeted schools. The researcher ended up with 55 primary schools participating in the research project. These schools could be regarded as having been randomly selected because each school had an equal chance of being included in the sample (Welman and Kruger, 1999). This process ensures that the findings of the study would be truly representative of the entire Soweto, rather than a particular ethnic group in the Soweto population.

The selection procedures were as follows:

- A letter was written to the Gauteng Department of Education requesting permission to conduct research in Soweto mainstream primary schools (see Appendix II). The researcher took the letter personally to the Department of Education in Johannesburg, after which permission was granted verbally by the co-ordinator of Soweto Primary School.

- Thirty school principals were contacted by telephone and another 25 personally to request permission to interview the teachers in their respective school. The two different methods of requesting permission depended on the distance the researcher had to travel. The schools that were far were contacted telephonically and questionnaires were delivered after a telephone conversation with the principals. It was agreed that the questionnaires would be completed during break times and after school in order not to disrupt the teaching programmes.

- The school principals were asked to indicate the number of teachers teaching Grade 1 to Grade 4. Since the number of teachers involved in these grades differed from one school to the next, a specific number of questionnaires were provided for each school according to the number of teachers teaching Grades 1 to 4.

4.4.3 Description of subjects

A total number of 412 teachers, teaching Sub A to Std two (Grade 1 to Grade 4) pupils in the 55 selected primary schools were requested to complete questionnaires. Altogether 319 (77.43%) questionnaires were returned and of them 308 (96.55%) had been completed and could be analysed. Only 11 (3.45%) of the returned questionnaires were regarded as spoiled and subsequently disregarded. They were either not completed fully or the respondents had ticked more than one answer where only one answer was needed. For example, where respondents had to answer *Yes, No* or *Don't Know* by ticking the appropriate box, such respondents ticked all three boxes. According to Maxwell and Satake (1997) a good response rate would be 70% or higher. Since the response rate in this study was 77.43%, it could be considered very good and adequate for analysis and interpretation.

The total process of subject selection is illustrated in Table 4.1 below.

Table 4.1 Number of questionnaires distributed and returned

Number of questionnaires distributed.	Number of questionnaires completed.	Number of questionnaires used.	Number of questionnaire lost (not returned).	Number of questionnaires spoiled.
412	319 (77.43%)	308	93	11

More specific details concerning subjects will be presented in chapter 5.

4.5 MATERIALS AND APPARATUS

4.5.1 Questionnaire (Appendix III)

A questionnaire is a tool used to observe data beyond the physical reach of the observer (Leedy, 1980; Mitchell and Jolley, 1992; Leedy, 1993). In terms of the size of the sample population and restrictions of time, the use of a questionnaire as opposed to interviews was felt to be an appropriate methodological tool for this study. Other reasons for using a questionnaire were the following:

- Questionnaires are simple, cost and time effective.
- Subject contact is easy and a researcher can reach a wide range of persons in a short period of time.
- Questionnaires do not require trained staff to administer but can be self-administered. In self-administered questionnaires there is no room for interviewer bias, as the subjects complete the questionnaires themselves in the absence of the researcher.
- Subjects may have greater confidence in their anonymity and thus feel freer to express views they fear might be unpopular.
- There is uniformity in presentation (Oppenheim, 1966; Leedy, 1980; Ventry and Schiavetti, 1980; Bless and Achola, 1990; Mitchell and Jolley, 1992; Bless and Higson-Smith, 1995; Brink, 1996).

The major disadvantage of using a questionnaire is the low percentage returns (Oppenheim, 1966; Berdie and Anderson, 1977; Leedy, 1980; Ventry and Schiavetti, 1980; Bless and Achola, 1990; Mitchell and Jolley, 1992). In order to guarantee a high response rate, teachers were given only one day between the delivery and collection to complete questionnaires, and the researcher personally delivered and collected the questionnaires. A short covering letter outlining the nature of the study and guaranteeing confidentiality was also attached to the questionnaire in order to motivate teachers to participate.

To try and overcome the problem of poor response rate, the questions were made

simple, direct and well printed on white stationery (Dillman, 1978). Technical jargon was also avoided to facilitate understanding (Bless and Achola, 1990; Mitchell and Jolley, 1992). On the questionnaire the term central auditory processing was defined to facilitate understanding of the respondents. The term auditory processing disorder rather than central auditory processing disorder was used as is it less technical and might be more easily understood by the respondents.

The questionnaire was short and consisted of predominately closed-ended (as opposed to open-ended) questions as these are regarded as simple and easy to record and score. They also allow for easy comparison and quantification of results (Oppenheim, 1966; Bless and Achola, 1990,Mitchell and Jolley, 1992; Brink, 1996). The subjects were given an opportunity to express an opinion in their own words by asking them to clarify and expand on the choice of their responses to certain questions.

The ***questionnaire*** (Appendix III) consisted of twenty (20) questions that were sub-divided into four sections. Although the questionnaire consisted mainly of closed-ended questions, an attempt was made to allow for free expression of opinion by asking the respondents in some questions to support or clarify the choices they made in Section D. The layout followed to present different sections of the questionnaire is according to the developed sub-aims, seeing that this was the format adopted in Chapter 5.

Table 4.2 provides a breakdown of different sections of the questionnaire that were utilized to provide answers to the stated research question of this study in terms of the sub-aims referred to above. The method of presentation of the content of the questionnaire was based on the format used by Moodley (1999) who used a questionnaire compiled for an in-service training programme for community nurses in the identification of at-risk infants and toddlers.

Table 4.2 Content of questions included in the questionnaire based on Moodley (1999)

Section	Questions relating to biographical data	Questions relating to contact, characteristics and etiology	Questions relating to team members and methods of management	Questions relating to the level and nature of training received and further training required
A	1, 2, 3, 4, 5, 6, 7.			
B		8, 9, 10, 11.		
C			12, 13, 14, 15.	
D				16, 17, 18, 19, 20.

- **SECTION A:** This section covered the respondents' biographical data and consisted of seven (7) questions. The questions probed first and highest qualifications of the teachers, institutions where they received their first qualifications, year of qualification, number of years of teaching experience and the present grade they were teaching.

The above-mentioned questions were included in the questionnaire in an attempt to find out if teachers with a particular qualification, from a particular institution and qualified during a particular period did in fact receive training on CAPD.

The question concerning the current teaching grade was included to make sure that only the targeted subjects complete the questionnaires not any other teacher. Information gathered from this section assisted in compiling a profile of the population targeted in the research study.

- **SECTION B:** Section B consisted of four (4) questions probing the knowledge of teachers in terms of the characteristics of children with CAPD and their etiology. The reason for including this section was to find out whether teachers had come into contact with children with CAPD and were able to identify traits of this group. Questions on etiology were asked to find out what teachers associated CAPD with.

Question 8 was divided into three sub-questions probing teachers' exposure to/contact with children with CAPD. Question 9 and 10 required teachers to indicate characteristics of children with CAPD and Question 11 dealt with some of the etiology of CAPD.

The information received from Section B provided answers for the second sub-aim of this research study.

- **SECTION C.** This section consisted of four (4) questions involving treatment of children with CAPD in terms of person and method. The aim of Section C was to find out to which professional teachers would refer a child with a CAPD. The belief regarding the etiology of CAPD held by the teacher will obviously influence treatment in terms of method(s) and person(s). The results of this section provided answers to the third sub-aim.

- **SECTION D:** (*The researcher felt it necessary to discuss Section D before Section B and C as the responses obtained from Section D have an impact on the responses of the other two sections (i.e. Sections B and C)).* Section D had five (5) questions probing the training of teachers regarding CAPD. The data obtained from this section assisted in achieving the objective of the first sub-aim. Section D was included to find out how and where teachers received exposure of CAPD. In these sections, teachers were given an opportunity to express/clarify their answers in their own words. Questions on the need of training were aimed at trying to investigate whether teachers regarded themselves as playing an important role in helping children with CAPD.

An outline of the questions included in the questionnaire and the motivation for inclusion of such questions is provided in Table 4.3. The format used to present an outline of the questions in the questionnaire is based on the format used by Moodley (1999).

Table 4.3: Description of and motivation for questions included in the questionnaire based on the guidelines or format of Moodley (1999)

SECTION	QUALIFICATIONS, TRAINING INSTITUTION AND TEACHING EXPERIENCE	MOTIVATION
A	**Biographical data**	
	1. First teaching qualification	To determine whether exposure to central auditory processing disorders differs on different training levels.
	2. Training institution	To determine whether certain training institutions offer courses/lectures on central auditory processing disorders.
	3. Year of first qualification	To investigate if teachers who qualified during a particular period/era received training on central auditory processing disorders.
	4. Highest teaching qualification	To find out if further education/training in the teaching field expose teachers to central auditory processing disorders.
	5. Year of highest qualification	Same as for the first year of qualification (see above).
	6. Years of teaching experience	To find out if experience influences knowledge of central auditory processing disorders and the management thereof.
	7. Present teaching grade	To ensure that only the targeted subjects complete the questionnaire - not any other teacher
B	**Contact and characteristics of central auditory pro0cessing disorders.**	
	8. (a), (b), (c) contact with children with	To probe teachers' exposure to children with

SECTION	QUALIFICATIONS, TRAINING INSTITUTION AND TEACHING EXPERIENCE	MOTIVATION
	central auditory processing disorders.	central auditory processing disorders.
	9. Characteristics of children with central auditory processing disorders.	To determine if teachers are able to identify children with central auditory processing disorders in terms of their characteristics.
	10. Intelligence	To establish teachers' knowledge of the relationship between intelligence and central auditory processing disorders.
	11. Aetiology	To determine teachers' knowledge of the causes of central auditory processing disorders. To investigate teachers' belief regarding the causes of central auditory processing disorders.
C	**Treatment of children with central auditory processing disorders in terms of person and method.**	
	12. Team members	To find out whether teachers can make appropriate referral of children with central auditory processing disorders.
	13. Treatment of children with central auditory processing disorders.	To investigate teachers' knowledge of the unique needs of children with central auditory processing disorders.
	14. Outgrowing the disorder.	To probe teachers' opinion on the relationship between age and central auditory processing disorders.
	15. Method of management	
D	**Training**	
	16. Level and nature of training.	To find out if teachers know how to manage

SECTION	QUALIFICATIONS, TRAINING INSTITUTION AND TEACHING EXPERIENCE	MOTIVATION
		children with central auditory processing disorders.
	17. Need of training on central auditory processing disorders.	To determine if the training that teachers' receive prepares them for dealing with children with central auditory processing disorders and to establish the extent of their training.
	19. Training on the management of children with auditory processing disorders.	To find out if teachers perceive themselves as playing a role in the management of children with central auditory processing disorders.
	20. Required level of training.	To determine what an appropriate level of training teachers in respect of central auditory processing disorders would be.
	Comments	To allow teachers to express in their own words any other issues not covered in the questionnaire.

4.5.2 Covering letter (Appendix IV)

A covering letter that identified the researcher and the nature of the study was attached to the questionnaire, and central auditory processing disorder was defined to facilitate responses.

Confidentiality was guaranteed and the researcher emphasized how important it was for teachers to participate in the project. Respondents were also promised feedback at the completion of the research project.

4.6 PROCEDURE

4.6.1 Pilot study

A pilot study involving ten Grade 1 to Grade 4 teachers was conducted as the final stage of questionnaire construction (Oppenheim, 1966; Berdie and Anderson, 1977; Ventry and Schiavetti, 1980; Bless and Achola, 1990; Mitchell and Jolley, 1992; Bless and Higson-Smith, 1995). The aim of this was to check whether the questions were clearly formulated and easily understood. The subjects in the pilot study were similar to the sample population utilized in the study (Oppenheim, 1966; Berdie and Anderson, 1977; Mitchell and Jolley, 1992). The pilot study subjects were requested to mark all the questions they did not understand and to give comments so as to help with the alteration of questions. Pilot testing occurred in a group context in a classroom after school at Gazankulu Primary School. The subjects completed the questionnaires in the presence of the researcher.

The pilot study subjects answered all the questions and did not indicate a need for the alteration of any. According to them the questions were clearly worded and easily understood, which indicated that the questionnaire was indeed applicable to the targeted population group. The results obtained by means of the pilot study were not included in the main data for analysis. The motivation for and results of the pilot study are however highlighted in Table 4.4.

Table 4.4 Motivation and results of the pilot study based on the guidelines of Moodley (1999)

AIM	To evaluate the applicability of the questionnaire in terms of questions being concise and easily understood.
SUBJECTS	Ten (10) Grade 1 to Grade 4 teachers.
RESULTS	Questions were clearly worded and easily understood. No need for alterations.

4.6.2 Data collection

Data was collected means of questionnaires. Teachers completed the questionnaires on their own and in their own time. As mentioned previously, teachers were given one day from delivery to collection of questionnaires to complete them. Questionnaires were delivered to the principals, who were asked to hand them to teachers of Grade 1 to Grade 4 for completion. The researcher therefore did not have any direct contact with the respondents.

4.7 DATA ANALYSIS PROCEDURE

An answer to the research question was reached by means of a statistical analysis of the data obtained (Brink, 1996). In this study responses from questionnaires were analysed to determine the teachers' training in and knowledge of CAPD. The following procedures were implemented to facilitate the process of analysis:

4.7.1 Checking of Questionnaires

Questionnaires were numbered and a check was done to ensure that they had been well completed. Questionnaires that were incomplete or completed inappropriately (e.g. having more than one answers where one answer is required) were considered unusable for analysis and therefore not included in the data analysis. Data received from questionnaires were given numerical codes to allow for and facilitate categorization of responses.

4.7.2 Statistical Analysis of the Questionnaire

In this study descriptive and inferential statistics were employed as procedures for organizing, summarizing, manipulating and describing quantitative data (Selitiz, Johada and Deutsch, 1974; Robinson, 1981; Babbie, 1989; McCall, 1990; Bless and Kathuria, 1993; Rosnow and Rosenthal, 1996; Neuman, 1997; Moodley, 1999)). Research has proved that this method is appropriate for analysing data in survey studies (Oppenheim, 1966) and that its procedures facilitate the process of presenting data in a manageable

and meaningful way (Babbie, 1989; Bless and Kathuria, 1993; Neuman, 1997).

Descriptive statistics, which included frequency distribution, percentages and variance, were used to present the data in a coherent and functional way (Robinson, 1981; Babbie, 1989; Bless and Kathuria, 1993; Rosnow and Rosenthal, 1996; Neuman, 1997). Unvaried analysis was employed to determine the relationship of the teachers' knowledge of CAPD and the characteristics thereof.

Inferential statistics was used to make inferences about a larger population from which the sample is drawn. Chi square as one of the parametric tests of significance was utilized at .05 level of significant ($p<.05$).

Where possible, tables were utilized to illustrate patterns of data and exceptions that might be obscured if presented in the text (Sternberg, 1988; Babbie, 1989; Bless and Kathuria, 1993; Neuman, 1997). Numerical codes and descriptions were used to interpret results and determine characteristics for Sections A and D respectively.
The data was analysed in accordance with the developed sub-aims. However, it was considered logical first to analyse the biographical data received from Section A (which contained the background information of the respondents), before following the sub-aim sequence of analysis. Section A was followed by Section D, which involved the actual training of teachers in respect of CAPD. Section B, which contained information on exposure to and the characteristics and etiology of CAPD, was subsequently analysed, followed finally by Section C, which dealt with the management of children with CAPD in terms of person and method.

4.8 SUMMARY OF CHAPTER FOUR

Chapter 4 provides the methodology that was utilized to determine the training and knowledge of teachers regarding CAPD. Aims, research design, subject selection and the development of material used for data collection were described and discussed in depth. Finally data collection and data analysis procedures used in this study were discussed.

5. CHAPTER 5: RESULTS AND DISCUSSION

5.1 INTRODUCTION

In terms of the constitution of South Africa, education is a fundamental right to be enjoyed by all citizens regardless of their colour, sex, race, religion, or any physical and mental challenges they may be facing (NCESS, 1997). In light of the inclusion process and the role that teachers are expected to play to the majority of children in South Africa, adequate and proper training and knowledge regarding children with disabilities and disorders is absolutely crucial. In order for teachers to provide a satisfactory service to all children, they need insight in terms of the abilities, limitations and learning styles of children with special needs. They need to be knowledgeable about these children's unique strengths and weaknesses.

To help children with disorders and/or disabilities to reach their full potential in order that they may contribute meaningfully to and participate in their society, teachers need to provide quality education that is sensitive to the children's needs and learning styles (NCESS, 1997).

Teachers constitute an important link between children and various professionals. Thus, teachers and speech-language pathologists and audiologists should form a collaborative partnership to promote early identification of and intervention for children with CAPD (Fletcher, 1998; Boland *et al,* 1998). A collaborative (or shared) understanding of children with CAPD will facilitate the development, promotion and sustaining of programmes tailored to help children with such disorders.

As mentioned earlier, it is the responsibility of the educational system to empower teachers to provide a quality service to children with CAPD. Teachers need to be aware of CAPD in children and must be able to assist these children. The speech-language pathologist and audiologist have an important role to play in training teachers as highlighted in figure 3.1.

The aim of this chapter is to present and interpret the results of this study in terms of the following sub-aims that have been developed:

(a) To establish whether teachers have received training in respect of CAPD, and if they have, what the level and extent of this training was.

(b) To describe teachers' knowledge of the characteristics and causes of CAPD.

(c) To determine the teachers' knowledge of the team members involved with children with CAPD.

The question:

"What is the training and knowledge of primary school teachers in urban black schools pertaining to CAPD?" was answered according to the three developed sub-aims that were linked to the different sections in the questionnaire.

5.2 DESCRIPTION OF RESULTS

The results of the study are presented according to the formulated sub-aims. By way of introduction to this discussion the biographical data obtained from Section A of the questionnaire (Appendix III) will be presented.

5.2.1 The biographical data of the subjects

This was obtained from Section A of the questionnaire (Appendix III). It is important to bear in mind that not all respondents (N=308) answered all of the questions in the questionnaire. Therefore, the number of respondents (N) differed from one question to the next. Table 5.1. highlights the responses obtained from Section A.

Table 5.1 The biographical data of the respondents. (N = 308)

QUESTION	NUMBER AND PERCENTAGES OF SUBJECTS WHO ANSWERED THE QUESTION	TYPE OF RESPONSES
1. First teacher's qualification	296 = 96.10%	Certificates: 205 Diploma: 91
2. Institution from which first teaching qualification was obtained.	300 = 97.40%	Colleges of Education: 274 Technical Schools: 24 Universities: 2
3. Year in which first teaching qualification was obtained.	301 = 97.73%	1957-1959: 11 1960 - 1969: 23 1970 - 1979: 114 1980 - 1989: 86 1990 - 1999: 67
4. Highest teaching qualification.	261 = 84.74%	Certificate: 55 Diploma: 181 Degree (BA): 25
5. Year in which highest teaching qualification was obtained.	247 = 80.19%	1957 - 1959: 13 1960 - 1969: 6 1970 - 1979: 20 1980 - 1989: 41 1990 - 1999: 167
6. Years of teaching experience.	302 = 98.05%	1 - 10: 63 11 – 20:110 21 – 30:108 >31 21
7. Grade that teacher is teaching currently.	306 = 99.35%	Sub A / Grade 1: 75 Sub B / Grade 2: 72 Std 1 / Grade 3: 75 Std 2 / Grade 4: 84

As seen in Table 5.2. the majority of teachers did not deal with CAPD during their basic training as teachers. Of the 301, (88.37%) respondents indicated a total lack of such training during this period. Although 35 respondents (11.63%) reported to have received training in CAPD, only 17 of them described the nature of lectures/courses that had exposed them to CAPD.

As seen in Table 5.2 the percentage of teachers that have received training (11.63%) is low and highlights the importance of including training regarding CAPD in teachers' formal training. These results emphasize the importance of greater responsibility on the part of the Department of Education as well as training institutions to introduce the condition of CAPD to teachers. This could be done as part of the teaching curriculum, in- service training, continuing education programmes or any other form that would be suitable for both the Education Department and training institutions.

The reasons why teachers perceive they should receive this training - derived from responses to Questions 17 and 19 are provided in Table 5.3.

Table 5.3 Respondents who needed training on central auditory processing disorders

QUESTION		RESPONSES				
17.	Should teachers receive training in central auditory processing disorders?	YES 287 = 96.31% of 298				
Why is the training needed? (N = 298)		- To assist/identify children with a central auditory processing disorders (152). - To know methods of helping these children (11). - To understand these children (33). - To be able to deal with such children (88). - Opportunity to learn Sign Language because (3) special schools are limited in number.				
19.	Should teachers treat children with central auditory process-sing disorders? (N = 289)	YES 272 94.12%	NO 17 5.88%			
20.	The level at which central auditory processing disorders should be introduced to teachers. (N=484).	1st year 153	2nd year 62	3rd year 59	4th year 61	In-service training 97
Note:	**Some respondents gave more than one answer in terms of level of training.**	93.29% of 164	83.78% of 74	85.51% of 69	88.41% of 69	89.81% of 108
Comments: In the open-ended question N=181 = 63.07% indicated the need for training.						

The subjects' responses to questions 17 and 19 as well as the comment section showed that 96.31% of the teachers felt that they required training in CAPD. The reasons provided included that teachers should be able to identify and refer these children as well as assist them in the classroom. With the transformation that is taking place in the Department of Education, it is of vital importance that teacher training on

CAPD be included in order to allow the successful management of all learners.

The respondents felt that this training would be both beneficial as part of their basic training as well as in-service training after graduation. Although the responses to Question 20 do not differ significant, the majority of respondents indicated that they preferred training on CAPD be introduced at first-year level and during in-service training - 153 (93.29%) and 97 (89.81%) respectively.

Responses to Question 18 indicated that approximately half of the teachers, namely 148 out of 269 (55.02%) had not been aware of CAPD prior to this project. The remaining 121 (44.98%) reported however that they had known about condition prior to the study. The method by which this knowledge was obtained is highlighted in Table 5.4.

Table 5.4 Responses of teachers who knew about central auditory processing disorders prior this project. (N = 121)

	NATURE OF EXPOSURE	NUMBER OF RESPONDENTS
(a)	Knowing someone who is deaf	87
(b)	Through a school nurse	4
(c)	Remedial education	18
(d)	Workshops	6
(e)	Through a colleague	3
(f)	Through media (TV), e.g. someone interpreting the reading of the news through sign language.	3

It is evident from Table 5.4 that the majority of the respondents who reported knowledge of CAPD prior to the study did not understand that deafness and CAPD are two separate disorders. While these disorders may occur together in one individual they usually present separately.

From the responses to the issues related to the sub-aim of teachers' formal training on

CAPD, it can be concluded that teachers were not aware of CAPD as a disorder and that they had received very limited, if any training in CAPD. As highlighted in the introduction there are currently no speech-language pathologists and audiologists working in schools in the Soweto area. If such a partnership existed between these professionals, teachers would have been more aware of CAPD and would not have confused the condition with hearing impairment. This confirms the need in the education system to expose teachers to CAPD and the need to empower them to deal with children with such disorders and to provide opportunity for collaboration between teachers and speech-language pathologists and audiologists.

In chapter 1 it was stated that the findings of research into the relationship between CAPD and academic achievement are not recognised and implemented in most educational settings (Katz and Wilde, 1994; Nielsen, 1997). This finding is also relevant to the schools in Soweto serving the black community.

Furthermore, the results of Section D stress the need for a working partnership between speech-language pathologists and audiologists (Boland *et al.,* 1998; Fletcher, 1998), especially during this new dispensation where there are calls for integrating children with disabilities/disorders into mainstream schools (Giliomee, 1995; NCESS, 1997).

Against the background of general consensus about the need for training, it is clear that teachers could benefit from training that focuses on CAPD. Such training will also help teachers to become aware of the important role they play in the management of children with these disorders.

The existence of a working relationship between speech-language pathologists and audiologists and teachers in mainstream primary schools will benefit the needs of children with CAPD as speech-language pathologists and audiologists are capable of providing services in a variety of settings (Boland *et al.,* 1998). Speech-language pathologists and audiologists are equipped with skills regarding CAPD and they can therefore provide a quality service within the professional team that focuses on CAPD

or any other form of speech-language and hearing disorders that may impact on the child's academic performance (Boland *et al.,* 1998; Fletcher, 1998).

To be able to eradicate the distorted or stereotype views held by teachers about children with CAPD, teachers and speech-language pathologists and audiologists need a committed working relationship (Boland *et al.,* 1998; Fletcher, 1998). Teachers can also increase their knowledge of CAPD by drawing from the skills of speech-language pathologists and audiologists, and in this way they can facilitate the development of specific programmes tailored to meet the needs of children with CAPD (Bellis, 1996; Boland *et al.*, 1998; Fletcher, 1998).

A working partnership between the above professionals will assist in making changes to the South African education system which in turn will benefit the child with CAPD. With the different stakeholders working together as a team, transformation could be viewed as a challenge rather than a problem and collectively the team can develop a new service that will benefit children who cannot reach their potential without extra assistance (Boland *et al.,* 1998; Fletcher, 1998).

A CAPD service should be delivered by employing speech-language pathologists and audiologists in schools. However, in view of the shortage of speech-language pathologists and audiologists in South Africa, the training institutions in this field could offer courses to train teachers in the management of children with CAPD.

5.2.3 The Teachers' Knowledge Of Central Auditory Processing Disorders

The second sub-aim of this study was to investigate the teachers= actual knowledge of CAPD. This sub-aim was met by interpreting the data obtained from Section B of the questionnaire. The information obtained in this section related to their experience of children with CAPD in their classes, the symptoms and behaviours with which a child with CAPD presents and finally their understanding of the causes of CAPD.

The question on whether or not teachers had any contact with children with CAPD

(question 8(a)) was compared with their knowledge of some of the common characteristics displayed by children with CAPD (i.e. Question 8(a) and Question 9). The results are clearly contrasted in the cross tabulations. The Chi-square test at P=<0.05 ratio statistical technique was utilized to achieve answers for questions 8(a) and 9 as well as 8(a) and10. Tables 5.5(a) and (b) provide information on the results of Questions 8(a) and 9 as well as question 10.

Table 5.5(a) Teachers' knowledge of the characteristic of children with central auditory processing disorders (Correlated with exposure or no exposure to CAPD)

Exposure to CAPD (Question 8(a))		Yes, have had exposure to children with CAPD in their classrooms.			No exposure to children with CAPD in their classrooms.			Difference between groups – significant or not significant.	
Characteristics of children with central auditory processing disorders (Question 9)		8(a) Yes %			8(a) No %			P value	Results
		Yes	No	Don't know	Yes	No	Don't know		
(a)	Poor concentration	85.43	9.27	5.30	62.61	13.04	24.35	<.0001	Significant
(b)	Hearing problems/-hearing loss.	81.49	5.95	4.46	30.11	5.20	16.67	0.0558	Not significant
(c)	Difficulty following directions	81.46	13.25	5.30	58.77	18.42	22.81	<.0001	Significant
(d)	Slow to answer questions	90.97	7.10	1.94	66.07	16.07	17.86	<.0001	Significant
(e)	Use sign language	31.13	54.30	14.57	40.71	38.05	21.24	0.0311	Significant
(f)	Localize sound	40.00	40.71	19.29	26.67	40.95	32.38	0.0267	Significant
(g)	Have low self-esteem	75.32	14.94	9.74	48.70	21.74	29.7	<.0001	Significant
(h)	Reading and spelling problems	83.33	10.26	6.41	60.53	21.05	18.42	0.0001	Significant
(I)	Memory problems	64.24	23.18	12.58	43.12	25.69	31.19	0.0003	Significant
(j)	Distracted by visual and auditory stimuli	53.42	26.03	20.55	43.52	31.48	25.00	0.2956	Not significant
(k	need repetition.	93.13	4.38	2.50	78.26	7.83	13.91	0.0005	Significant
(l)	Watch speaker's face	85.90	8.33	5.77	64.60	21.24	14.16	0.0002	Significant
(m)	Misunderstand what is said	79.22	14.94	5.84	47.79	31.86	20.35	<.0001	Significant
(n)	Respond sometime to sounds and speech	82.43	10.14	7.43	46.90	23.89	29.20	<.0001	Significant

As can be seen in Table 5.5(a), the teachers with prior experience of children with CAPD in their classrooms were better able to correctly recognise the characteristics of children with CAPD. This included aspects such as poor concentration, difficulty following directions, slow responses to questions, poor sound localization, low self esteem, reading and spelling difficulties, easily distracted, needing repetition, misunderstanding of speech information and difficulty listening in the classroom. It is concerning to note that both teachers with and without experience of children with CAPD in their classrooms incorrectly equate CAPD with a peripheral hearing disorder. Teachers with experience with children with CAPD were however less likely to identify the use of sign language as a characteristic.

The results emphasize the importance of training in the field of CAPD as well as hearing impairment for teachers so that they may be able to correctly identify and refer children with CAPD.

Table 5.5(b) provides a summary of teachers' understanding of the relationship between intelligence and CAPD. This information was derived from question 10 that required the respondents to rate the intelligence of children with CAPD. This was an extension of the issue of the characteristics of this population. The rating of the intelligence of children with CAPD was placed against the information of teachers' exposure to these children, i.e. Question 8(a) of the questionnaire as illustrated in Table 5.5(b).

Table 5.5(b): Teachers' knowledge of the intelligence of children with central auditory processing disorders

STATEMENT	CHARACTE-RISTICS	8(A) YES, HAVE HAD EXPOSURE TO CHILDREN WITH CAPD YES %	8(A) NO EXPOSURE TO CHILDREN WITH CAPD NO %	P VALUE	RESULTS
Children with auditory pro-cesssing dis-orders are	Intelligent	21.77	11.02	0.012	Significant for all three.
	More intelligent	0	4.49		
	Less intelligent	78.23	66.29		

Table 5.5(b) indicated that both groups of teachers (those who had contact with children with CAPD and those who did not) agree that these children are less intelligent compared to other children in the class. This finding contradicts the literature which reports that children with CAPD usually have average to above average intellectual abilities (Campbell, 1994; Bellis, 1996), but their inability to process auditory information adequately result in poor school performance.

Table 5.6 provides a summary of teachers' knowledge of the causes of CAPD. This information was derived from question 11 of the questionnaire.

Table 5.6: Teachers' knowledge of factors associated with the etiology of central auditory processing disorders

ETIOLOGY OF CENTRAL AUDITORY PROCESSING DISORDERS.		N	YES	NO	DON'T KNOW
(a)	Watching TV a lot	288	18.75%	58.68%	22.57%
(b)	Born of deaf parents	288	27.78%	46.88%	25.35%
(c)	Verbal, emotional or sexual abuse	284	43.66%	23.94%	32.39%
(d)	Mental problems/disturbances	289	56.06%	20.07%	23.88%
(e)	Painful and discharging ears	295	67.46%	19.66%	12.88%
(f)	Low socio-economic status	286	33.22%	36.01%	30.77%
(g)	Bed wetting	284	14.79%	48.59%	36.62%
(h)	Heredity	289	57.44%	17.65%	24.91%
(I)	Left handedness	281	12.81%	62.28%	24.91%
(j)	Hearing loss	286	67.48%	10.84%	0.2168
(k)	Problem with the parts of the brain that receive sounds/speech	295	70.17%	3.73%	26.10%
(l)	Slow development	289	52.25%	21.45%	26.30%

The cause of CAPD is not clear but is suspected to be due to difficulty in the Central Auditory Nervous System=s processing of auditory information (AJA, 1996). CAPD is found to have a higher prevalence among children with otitis media (Duane, 1977; Rampp, 1980; Katz and Wilde, 1985; Keith, 1988; Katz and Wilde, 1994; Bellis, 1996;

DeConde Johnson *et al.*, 1997). As mentioned in the previous chapters, CAPD can co-occur with other medical conditions (Kelly *et al.*, (1994) for example, hearing loss, but not being a causative factor.

Although the majority of the teachers were able to identify most of the causes of CAPD, there seemed to be a trend to associate CAPD solely to medical complications, for example, otitis media (Question 11(e) (67.46%)), heredity (Question 11(h) (57.44%)), hearing loss (Question 11(j) (67,48%)), lesion of the auditory cortex (Question 11(k)(70.17%)) and slow development, (Question 11(l) (52.25%)).

According to the literature there is a close association between CAPD and otitis media, (Question 11(e)), and otitis media is indeed one of the causes of CAPD (Katz and Wilde, 1994; DeConde Johnson et a., 1997). Children with CAPD often have a history of otitis media, especially in the early years (1 - 12 years) of their lives (Katz and Wilde, 1994).

Bellis, (1996), as well as Katz and Wilde, (1985) state that it is not uncommon to find that one of the parents of children with CAPD experienced similar difficulties in his/her youth. It could therefore be inferred that some children might have inherited their CAPD (Question 11(h)).

Although Katz and Wilde, (1985) consider auditory processing disorders not as a medical problem but rather as an academic problem, some children presenting with these disorders were reported to have a diseased central auditory nervous systems (Question 11(k)) or delayed maturation (DeConde Johnson *et al.*, 1997). It could be argued that Katz and Wilde=s (1985) view is correct, as the impact of CAPD is manifested in the academic sphere. As mentioned before, the medical histories of the majority of children with CAPD, are excellent, except for few individuals. These children do not present with identifiable organic problems that may be linked to CAPD (Kelly *et al.*, 1984; Campbell, 1994, Katz and Wilde, 1985).

The respondents also indicated hearing loss (64.48%) as a causative factor. This may

be attributed to these children's difficulty to understand what is being said to them, which is normally interpreted by laypersons as hearing difficulty/loss/deafness. As mentioned earlier, hearing loss can co-occur with CAPD (Campbell, 1994; Katz and Wilde, 1994; Bellis, 1996; Deconde Johnson *et al.*, 1997) but does not necessarily cause the disorders.

Factors such as verbal, emotional or sexual abuse (Question 11(c) and mental problems/disturbances (Questions 11(d)) have also been given higher percentages (43.66% and 56.06% respectively) by respondents as being possible causes of CAPD. In the literature, however, no association could be found between these two factors and CAPD. The respondents might have included them due to the behavioural changes displayed by children with such problems. The learning pattern of abused children and those with emotional problems may be affected somehow, which may lead to poor school performance. Another reason why the two factors were included could be the current situation in our country where the number of abused children (in one way or another) is on the increase (NCESS, 1997). This is also the case with mental disturbances.

It is very interesting to note that respondents did not consider being born of deaf parents (Question 11(b) (27.78%)) as a possible causative factor, whereas heredity (Question 11(h) (57.44%) was given a higher percentage on the affirmative side. Teachers gave a relatively high percentage of "no" responses (46.88%) to the factor of being born of deaf parents. A possible explanation could be that most of the children in their schools had parents with "normal" hearing, with the result that they do not associate the problems of their students with that factor.

Another noteworthy factor was the low scores on low socio-economic status as a possible cause of CAPD. The respondents gave 33.22% "yes" responses, 36.01% "no" responses and 30.55% "don't know" responses. The difference among these responses is not at all significant, despite the fact that one would have expected a high response rate on the affirmative side. This would have corresponded with the tendency to associate low socio-economic status with disabilities/disorders, or consider it the

cause of such condition or barrier to many resources (NCESS, 1997). According to Katz and Wilde, (1985; 1994), many children with CAPD have low socio-economic status. Nevertheless, socio-economic status cannot be regarded as a causative factor of CAPD - perhaps rather an aggravating variable.

The remaining factors included in questions 11(a) namely, watching TV a lot, (g) bed wetting and (i) left-handedness which are not related to causes of CAPD obtained high percentages on the "no" and "don't know" responses. This might be attributed to the fact that teachers are not familiar with the children's behaviours at home regarding questions 11 (a) and (g). In the case of (i) (left-handedness), the high percentage of "no" could be related to the fact that many of the children in their schools (or with whom they have come into contact) are right-handed – even those thought to have CAPD. The issue of left-handedness is however, noted in the literature as being common in the families of children with CAPD (Rampp, 1980; Katz and Widle, 1985; Katz and Wilde, 1994).

5.2.4 Team members identified to deal with children with central auditory processing disorders

The third sub-aim involves the referral of children with CAPD and was achieved by analysing and interpreting data obtained from section C of the questionnaire. This section dealt with treatment of children with CAPD in terms of person and method, and relates to Questions 12, 13 and 15, as presented in Tables 5.7 and 5.8.

Table 5.7: Teachers' knowledge about team members involved in remediation children with central auditory processing disorders

	PROFESSIONAL	N	YES	NO	DON'T KNOW
(a)	Doctor	287	94.43%	3.48%	2.09%
(b)	Religious leader	249	33.33%	46.99%	19.68%
(c)	Sangoma	238	15.13%	61.34%	23.53%
(d)	Teacher	271	71.49%	21.40%	7.01%
(e)	Speech Therapist	282	87.94%	7.80%	4.26%
(f	Speech and drama teacher	251	61.75%	20.72%	17.53%
(g)	Remedial teacher	286	82.87%	11.09%	5.24%
(h)	Physiotherapist	250	52.40%	25.60%	22.00%
(I)	Occupational Therapist	245	56.33%	15.92%	27.76%
(j)	Parents	262	66.41%	22.90%	10.69%
(k)	Friends	247	51.42%	35.22%	13.36%
(l)	Psychologist	261	68.97%	17.62%	13.41%
(m)	Dietician	238	18.49%	55.46%	26.05%
(n)	The child him/herself 1	248	53.63%	31.85%	14.52%
(n)	None (nobody) 2	186	0.0269	66.13%	31.18%

The results obtained from the respondents revealed that a team approach is crucial for remediation of children with CAPD. This finding is substantiated by recommendations in the literature (Katz and Wilde, 1985; Bellis, 1996). Except for the speech and drama teacher, the respondents managed to identify most of the team members involved in remediating children with CAPD. The members identified included a doctor, speech-language pathologist and audiologist, remedial teacher, classroom teacher, psychologist, parents, occupational therapist, physiotherapist, and friends. Not all of these individuals are however involved in the management of each child's condition. Every child's unique strengths and weaknesses should be taken into consideration.

Literature as mentioned in Chapter 3, indicates that children with CAPD benefit from the team members mentioned as well as from dieticians, paediatricians, ear, nose and throat specialists (ENTs) and neurologists (Barr, 1972; Katz and Wilde, 1985; Katz and Kuisnierczyk, 1993; Campbell, 1994; Musiek, and Chermak, 1994; Bellis, 1996, Nielsen, 1997). In this research, however, the respondents did not consider dieticians to be part of the team. This is illustrated by the majority of the respondents (55.46%) indicating a "no" response to whether the dieticians play a role in remediating children with CAPD. Although 18.49% and 26.05% answered respectively "yes" and "don't know" to this question.

Throughout the questionnaire, it is clear that teachers regarded CAPD as a medical problem, (hearing loss in particular). This was evident from the fact that the highest percentage of responses was allocated to a medical doctor being part of the team. A doctor is probably the first professional to see a child who has been referred to the clinic/hospital with a referral letter suggesting hearing loss. Although speech-language pathology and audiology are relatively unknown among black communities, the speech-language pathologist and audiologist was the second highest professional team member indicated by the respondents to attend to the child with CAPD. Bearing in mind the unfamiliarity of speech-language pathologist, the prioritization made by the respondents has logic. The position of the speech-language pathologist and audiologist could have been influenced by the label of the researcher set out in the accompanying letter. Thus this response should perhaps be ignored.

The majority of respondents did not consider a religious leader and a sangoma as important team members. It is difficult to explain the reasons behind the high percentages of "no" responses and low percentages of "yes" and "don't know" responses in this regard. The only possible explanation could be the belief that in the urban (educated) situation these persons are not as important anymore. Furthermore, there is no evidence in literature that the above-mentioned professionals (religious leader and sangoma) do in fact play a role.

Teachers have also included the child him/herself and friends as persons who can play a role in the remediation of CAPD. This is true, because a child has to be motivated and committed to the programme in order to benefit from it. As regards to friends, it is according to the literature (Katz and Wilde, 1985; Bellis, 1996; Sloan, 1998) important for such a child to have a note taker during lessons so as to ensure his/her undivided attention.

Teachers strongly believe that children with CAPD can be helped. This was clear from the responses where they denied (66.13%) the statement that no one could help these children.

Figure 5.1 provides a summary of the respondents' knowledge of managing the child with CAPD and the potential that children have to outgrow CAPD. The information was derived question 13 dealt with the actual handling of children with CAPD. A total of 148 (51.57%) out of 287 respondents indicated that these children should be handled differently in the classroom. This is also supported by literature where preferential seating, provision of a note taker and other benefits mentioned in Chapter 3 (Katz and Wilde, 1985; Bellis, 1996; DeConde Johnson *et al.*, 1997; Sloan, 1998) are normally not enjoyed by other children in the class.

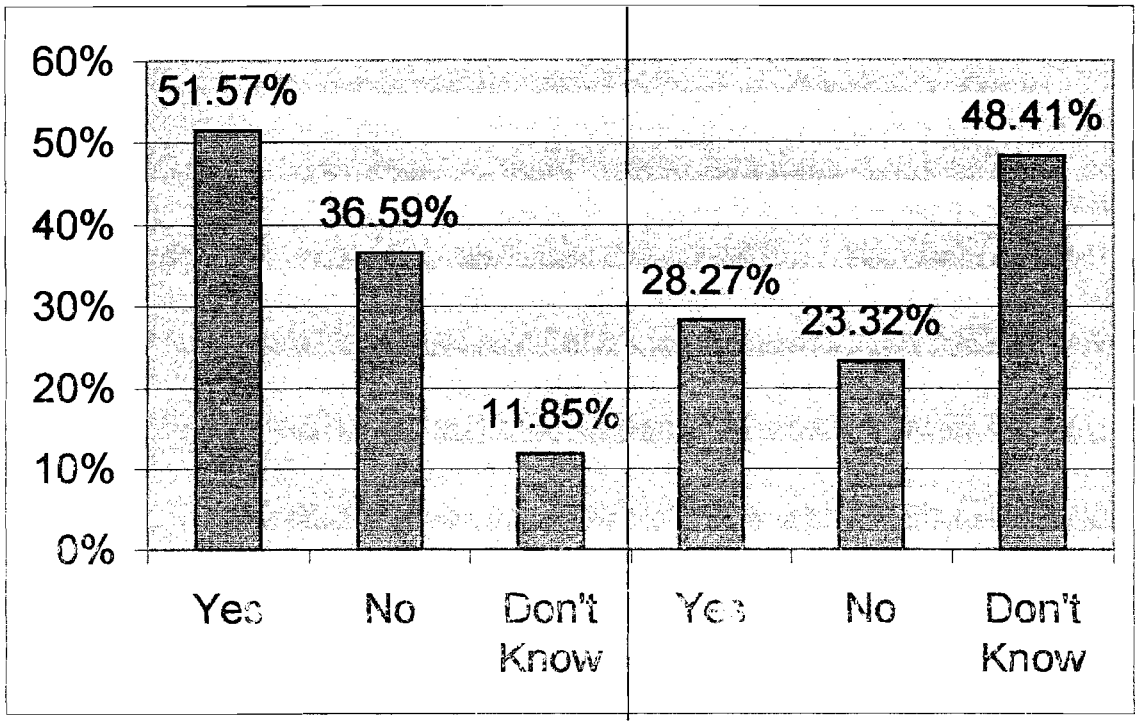

Figure 5.1: The respondents' knowledge regarding the handling of children with central auditory processing disorders and their knowledge on whether central auditory processing disorders can be outgrown or not

Out of the 287 respondents, 105 (36.59%) felt that children with CAPD should be treated the same as other children in the class, while and 34 (11.85%) of the respondents did not know how they should be treated. The view of treating these children differently is in conjunction with literature in this field, as these children are given special attention and their environment has to be modified (Katz and Wilde, 1985; Cline, 1988; Campbell, 1994; Berg *et al.,* 1996; Bellis, 1996; Bench and Maule, 1997; Sloan, 1998) so as to allow them to participate meaningfully and benefit from the learning environment.

Question 14 probed the teachers' knowledge about the possibility of children outgrowing CAPD. Majority of the respondents - 137 out of 283 or (48.41%) - answered that they do not know whether this was possible. Eighty respondent (28.27%) answered "yes" and 66 respondents (23.32%) answered "no". According to literature, however, CAPD cannot be outgrown (Stach and Loiselle, 1993) but children are able to

learn strategies and develop coping mechanisms to try and overcome their auditory processing deficiency.

Table 5.8 provides a summary of the method in which the teacher can assist the child with CAPD in the classroom. The information was obtained from question 15 of the questionnaire that required the respondents to indicate the method they were supposed to use in class to help children with CAPD. The results are highlighted in Table 5.8.

Table 5.8: Teachers' knowledge about strategies of helping children with a central auditory processing disorders

	METHOD	N	YES	NO	DON'T KNOW
(a)	Ignoring the child	246	0.41%	98.57%	1.22%
(b)	Punishment	244	1.64%	97.13%	1.23%
(c)	Special attention	296	92.57%	6.24%	1.01%
(d)	Hearing aids	280	93.57%	3.98%	2.50%
(e)	Seating the child at the front row	283	88.69%	7.07%	4.24%
(f)	Reducing noise in the classroom by using carpets and curtains	250	41.60%	36.00%	22.40%
(g)	Looking straight at the child while speaking.	281	83.99%	11.03%	4.98%
(h)	Repetition of questions and orders	281	88.97%	6.41%	4.63%
(I)	Speaking loudly when talking to the child	264	59.47%	30.66%	0.0985
(j)	Asking someone to take note for the child.	245	9.80%	82.45%	7.76%
(k)	Repeating the information from time to time.	276	80.80%	14.49%	4.71%
(l)	Checking from time to time to see if the child understands.	295	93.90%	5.08%	1.02%

Apart from hearing aids (93.57%) and speaking loudly to a child – the results of Table 5.8. illustrate that the majority of respondents were able to identify some of the useful strategies recorded in the literature for helping children with CAPD. However, the fact that hearing aids and speaking loudly are indicated as important strategies, confirms that teachers often confuse CAPD with hearing loss.

Another striking statement is the negative evaluation of the strategy of providing a note taker to a child (82.45% of 245 respondents). In Table 5.7 the inclusion of friends (Question 12 (k)) (51.42% of 247 respondents) in the remediation team was implied, but it is clear that the specific role of this friend is unsure. It is unfortunate that the respondents were not asked to give reasons for the choice of members included in the remediation team.

It was also interesting to note that the use of noise absorptive materials, for example carpets and curtains, was also considered as a valid remediation strategy. Out of 250 respondents, 41.60% were in favour of this strategy, 36.00% were not in favour and 22.40% "did not know". The use of this strategy is widely supported in the literature as part of modifying the child's listening environment (Katz and Wilde, 1985; Campbell, 1994; Berg *et al.*, 1996; Bellis, 1996). Unfortunately it is also related to the availability of funds, which could be a negative indication for use in black schools.

The majority of respondents did not favour methods such as ignoring and punishing the child. This was evident from the fact that 98.57% of 246 respondents were not in favour of ignoring the child and 97.13% said "no" to punishing the child. The strong feeling against these two methods may be perhaps resulting from the belief held by most of the teachers that is a recognised disorder. They probably felt that it was not fair to practise these methods, as the child did not choose to have hearing problems. Secondly, it could be related to the fact that corporal punishment (which was commonly used by teachers in the past) is no longer allowed in South African schools.

5.3 CONCLUSION

In the realization of the sub-aims, it became apparent that the teachers did not receive training in CAPD and were not aware of CAPD. They confused CAPD with hearing loss. However, teachers were able to correctly identify most of the characteristics of children with CAPD with the exception of hearing loss, which tends to be equated with CAPD. The teachers in the study also believed that a team approach is important for the remediation of children with CAPD. They felt that they themselves were important

team members when it came to dealing with children with CAPD. However, it is clear that they feel it is necessary for teacher to receive training regarding CAPD so that they are able to provide an accountable service to these children.

The positive attitude displayed by teachers towards training in CAPD can facilitate the development of a working relationship between speech-language pathologists and audiologists and other team members involved in remediation of children with CAPD. Speech-language pathologists and audiologists can assist in training teachers regarding identification, referral management of children with CAPD. The collaboration between speech-language pathologists and audiologists is crucial for remediation of CAPD. Therefore the Gauteng Department of Education has a responsibility of employing speech-language pathologists and audiologists in mainstream schools of Soweto (and other black townships as the problem is not only confined to Soweto schools) to facilitate early identification and intervention of children with CAPD and other speech-language and hearing problems that impact on children's performance in the academic sphere.

5.4 SUMMARY OF CHAPTER FIVE

The data in the study were analysed and discussed according to the sub-aims developed. The introduction of this chapter dealt with challenges facing the education system in our country. The results revealed a serious need for training teachers about CAPD, specifically in the new dispensation. From the results of the study, it is evident that a working partnership between speech-language pathologists and audiologists and teachers is very crucial in order to assist children with CAPD.

6. CHAPTER 6: CONCLUSIONS AND IMPLICATIONS

6.1 INTRODUCTION

Teachers have an important role to play in the early identification and referral of children with CAPD as well as managing these children in the classroom setting (Bellis, 1996). Teachers thus require training and knowledge in the field of CAPD. The Apartheid policies in South Africa have produced black teachers that have not necessarily been adequately educated themselves or trained to deal with children with disabilities, including CAPD (NCESS, 1997). The aim of the study was to determine training and knowledge of black mainstream primary school teachers in Soweto.

6.2 SUMMARY OF THE RESULTS

The results of the study show that:

- Only 11,63% of the teachers had received training regarding CAPD. 96,31% of the teachers felt that they should receive training in CAPD and that this training should be part of their basic qualification and also part of in-service training.
- Teachers have a poor knowledge understanding of the causes of CAPD and the behaviour of children with CAPD. Teachers tend to equate CAPD with hearing loss and not as two separate disorders. While these disorders may occur together in one individual they usually present separately.
- The teachers identified medical doctors, teachers, speech-language pathologists and audiologists and remedial teachers as the primary team members for managing CAPD in children. The teachers are however uncertain about their managing children with CAPD.

6.3 FUTURE RESEARCH

This study has revealed new facts about and insights into the training and knowledge of black teachers in mainstream primary schools as far as CAPD are concerned. Based on the results of this study, it is recommended that more research should be conducted on other childhood disorders that impact on the child's learning abilities, in order to assist in early identification of such children and empower teachers to handle them. This will also enhance total team functions within the educational context.

It is furthermore evident from the study that teachers consider themselves among the key parties in the remediation of children with CAPD. Further research is however, needed to determine whether they have a similar attitude towards other disorders that have a negative influence on the child's performance at school.

6.4 EVALUATION OF RESEARCH METHODOLOGY

The research methodology used in this study has the following limitations. *Firstly,* a relatively small number of subjects were used. However, with regard to the number of institutions represented, the range of qualifications covered and the differences regarding years of experience, an inference could be made that the results are a true reflection of black teachers in mainstream primary schools in Soweto. Also, the inclusion of schools from across Soweto ensures that the results are representatives of the township, as it covered schools from different areas and levels of wealth/poverty.

The *second limitation* is that only teachers of a particular township (Soweto) in the country were involved in this study. Although Soweto is one of the largest townships in our country and a true reflection of urban township (Turton, 1986; Bonner and Segal, 1998), it does not necessarily represent the whole of South Africa. In terms of time frame and financial constraints, however, the sample is regarded significant for the purpose of the study. Further research in other parts of the country is recommended.

The *third limitation* is the utilization of a specific population group only. The results

obtained could however be a true reflection of the training institutions attended by the respondents, as they are predominately black and most teachers qualified during the era of a fragmented education system (NCESS. 1997). It will be interesting to examine whether the results obtained in this study are the same for other populations groups in the country, i.e. coloureds, Indians and whites.

6.5 CLINICAL IMPLICATIONS

It is clear from the results of this study that teachers (96,31%) are positive about receiving training in CAPD. This probably stems from the fact that they have encountered such problems in their classrooms and are anxious to know how to handle these children. The learning institutions also have a responsibility to incorporate CAPD in their teaching curriculum.

Changes in the South African education system pose a challenge for the speech-language pathologists and audiologists to make other professionals and the community aware of CAPD and their impact on the child's academic performance. Such an awareness campaign should be launched at national, provincial and local levels (NCESS, 1997) and should involve not only different government departments such as the departments of Health, Education and Welfare, but also non-government organizations (NGOs) and the community. These stakeholders should work together in order to develop comprehensive service delivery programmes (Bellis, 1996; NCESS, 1997; Flecther, 1998; Boland, 1998). Such an initiative will also help to ensure early identification, appropriate referrals and early intervention in the lives of children with CAPD. Early identification and intervention will help to prevent the breakdown of learning that results from CAPD (NCESS, 1997).

Teamwork is very crucial for sharing of skills and facilitation of development and sustaining of programmes that will ensure that the communicative, social and learning skills of children with CAPD are optimized (Bellis, 1996; Flecther, 1998; Boland *et al.*, 1998). Government – in particular the departments of Education and Welfare - as well as professional bodies and NGOs (Bellis, 1996, Fletcher, 1998, Boland *et al.*, 1998)

need to see to it that programmes and centres are financed, developed and equipped to assist children with CAPD.

As speech-language pathologists and audiologists are experts on the area of CAPD (Sloan, 1998), they need to take responsibility for training of other team members (Bellis, 1996). They also need to establish mechanism for the early identification of children with CAPD and successful intervention (NCESS, 1997).

6.6 CONCLUDING REMARKS

Many children and parents have been left frustrated and despondent because of the presence of CAPD. The results of this study show that teachers regard CAPD as equivalent to hearing impairment and that the report of normal hearing after referring a child for a hearing assessment, has been frustrating. Lack of appropriate intervention and support has thus prevented many children from reaching their full potential.

The results of this study have revealed that there is a need for an awareness and special education among teachers regarding CAPD. Teachers need to be trained to identify children with CAPD and to effectively manage such children in the classroom. This will enable the teachers to not only view these children in a positive light, but also reduce their stigmatization (NCESS, 1997). It will also ensure early identification and intervention, which will undoubtedly be of benefit to the children who are directly affected by CAPD.

Numerical codes were given for questions 1, 2, 3, and 4 to assist in categorization of responses. The results revealed 44 different qualifications from 63 different institutions for questions 1 and 2. The year in which the first teaching qualification was obtained ranged from 1957 to 1999. The number of years of teaching experience ranged from one year to 43 years. Information obtained from Section A revealed that the respondents presented a wide spectrum with regard to variables of qualifications, training institutions, years of experience as teachers and the current standards they were teaching. The subjects thus constitute a heterogeneous population.

5.2.2 The level and extent of the teachers' training with regard to central auditory processing disorders

The first sub-aim that investigates the teachers= training on CAPD was answered through the interpretation of data obtained from section D. The latter dealt with training issues. Questions 16, 17, 18, 19, and 20 were used to obtain answers for the first sub-aim.

This sub-aim was accomplished by asking teachers whether they had been exposed to CAPD in their training and if they require additional training in this field.

The nature of the training received the subjects is presented in Table 5.2. and was derived from question 16.

Table 5.2 Responses and extent of training on central auditory processing disorders (N=301).

QUESTION	NUMBER OF RESPONSES		
16. Did teachers receive formal training in central auditory processing disorders?	Yes 35 = 11.63%	No 266 = 88.37%	
If yes: Method of exposure **(Of the 35 subjects, only 17 completed this section).**	Basic training 7 = 20%	Remedial education 3 = 9%	Workshop 7 = 20%

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Appendix I

Soweto map


Emergency Symbols
Hospital (24hr Casualty)
Hospital
Police Station
Fire Station
General Symbols
One-way
Entrance
Controlled Access
Traffic Light
International Airport
Hotel
Railway Station
Places of Interest
Place of Interest
Museum
Historical Monument
Provincial Heritage Site
North
Johannesburg
Community Services
Community Service
Traffic Department
Law Court
Government Office
Metro Police
Municipal Office
Municipal Clinic
Post Office
Place of Worship
Parking
Library
Recreation Centre
Theatre
Cinema
Shopping Centre
School
77
78
79
80
81
82
83
84
102
103
EA
EB
EC
ED
EE
Zondi
Jabulani
Jabulani Hostel
Jabulani Amphitheatre
Stadium
Zola
Moletsane
Tladi
Molapo
Moroka
Jabavu
Mofolo Central
(Mishenguville/ Mofolo)
Dube
Dube Hostel
Orlando West
Mofolo South
Klipspruit
(Fred Clark)
Nancefield
Nancefield Hostel
S.P.C.A.
George Tabor
MOROKA NANCEFIELD RD
KLIPSPRUIT VALLEY RD
POTCHEFSTROOM RD
MAHALEFELE RD
KOMA ST
KOMA RD
ZULU DR
Soweto
Chiawelo
Mapetla
Senaoane
Dlamini
(Chris Hani)
Pimville
Kliptown
(Freedom
Phefeni
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146
147
123
126

Appendix II

Consent letter of Gauteng Department of Education

APPENDIX II

University of Pretoria
Pretoria 0002 Republic of South Africa Tel (012) 4202357/4202816
Fax (012) 420-3517 http://www.up.ac.za

Department of Communication Pathology
Speech, Voice and Hearing Clinic
24th August 2000

Gauteng Department of Education

TO WHOM IT MAY CONCERN.

RE: PERMISSION TO INTERVIEW PRIMARY SCHOOL TEACHERS IN SOWETO.

I am a masters student at the University of Pretoria, doing some research in areas related to speech-language therapy and teaching. I am specifically interested in children with auditory processing disorders.

I would like to interview Grade 1 to Grade 4 teachers in randomly selected primary schools in Soweto. The questionnaire consists mostly of multiple choice questions and should not take more than twenty (20) minutes to complete.

The data received from the research, will enable professionals working with children with auditory processing disorders to extend and improve the service to these children.

I therefore request permission to conduct my research at the selected primary schools. I promise to treat all information confidentially and to give feedback after the completion of the research.

Your co-operation and assistance in this matter is highly anticipated.

Thank you.

Yours faithfully

TINTSWALO HLABANGWANE (MISS)
TH/th

Tel. No.: (011) 984-1517, (013) 653-2182 or 082 686 2060

SUPERVISORS: Prof. S.R. Hugo and Mrs N.G. Campbell.

Appendix III

Questionnaire

APPENDIX III

SECTION A :

PLEASE ANSWER THE FOLLOWING QUESTIONS :

FOR OFFICE USE

Questionnaire Number V1 ☐☐☐ 1-3

1. What is your first teacher's qualification? ..... V2 ☐☐ 4-5
   .....
2. At which institution did you obtain your first teacher's qualifications? V3 ☐☐ 6-7
   .....
3. In which year did you qualify? 19..... V4 ☐☐ 8-9
4. What is your highest teacher's qualification?..... V5 ☐☐ 10-11
5. When did you obtain your highest teacher's qualification? 19..... V6 ☐☐ 12-13
6. How many years of teaching experience do you have?..... V7 ☐☐ 14-15
7. What standard/grade are you teaching at present?..... V8 ☐ 16

SubA / Grade 1	
Sub B / Grade 2	
Std 1 / Grade 3	
Std 2 / Grade 4	

SECTION B :

FOR OFFICE USE

8. PLEASE INDICATE YES [Y] OR NO [N] WITH AN X FOR EVERY STATEMENT.

	Y	N		
a. Do you know children with auditory processing disorders?			V9	17
b. Are these children with auditory processing disorders in your current class?			V10	18
c. Were these children with auditory processing disorders in your previous class?			V11	19

9. PLEASE COMPLETE THE FOLLOWING SENTENCE BY TICKING THE APPROPRIATE BOX. Y = YES, N = NO AND DN = DON'T KNOW

Children with auditory processing disorders

	Y	N	DN		
(a) have poor concentration				V12	20
(b) have hearing problems or hearing loss				V13	21
(c) have difficulty following directions				V14	22
(d) are slow to answer questions				V15	23
(e) use sign language				V16	24
(f) are able to tell the direction of the sound (localize)				V17	25
(g) have low self-esteem				V18	26
(h) have reading and and spelling problems				V19	27
(i) have memory problems				V20	28
(j) are disturbed (distracted) by what they see and hear (visual auditory stimuli)				V21	29
(k) need repetition when spoken to				V22	30
(l) watch the speaker's face closely				V23	31
(m) misunderstand what is said to them				V24	32
(n) respond only some of the time to sounds and speech				V25	33
(o) have difficulty listening when the class is noisy				V26	34

10. Children with auditory precessing disorders are as

(a) intelligent		V27	35
(b) more intelligent			
(c) less intelligent			

than other children in the class.

11. PLEASE INDICATE YES [Y] OR NO [N] OR DO NOT KNOW [DN] FOR EACH OF THE FOLLOWING ALTERNATIVE ANSWERS.

Do you think the following factors cause auditory processing disorders?

	Y	N	DN		
(a) watching TV a lot				V28	36
(b) born of deaf parents				V29	37
(c) verbal, emotional or sexual abuse				V30	38
(d) mental problems/disturbances				V31	39
(e) painful and discharging ears				V32	40
(f) low socio- economic status				V33	41
(g) bed wetting				V34	42
(h) heredity				V35	43
(i) left handedness				V36	44
(j) hearing loss				V37	45
(k) problem with the parts of the brain that receive sound/speech form the ear				V38	46
(l) slow development				V39	47

SECTION C :

FOR OFFICE USE

PLEASE TICK THE BOX[ES] THAT YOU FEEL ANSWER THE QUESTION

12. **Do you think the following people can help a child with auditory processing disorders?**

	Y	N	DN			
(a) Doctor				V40		48
(b) Religious leader				V41		49
(c) Sangoma				V42		50
(d) Teacher				V43		51
(e) Speech Therapist				V44		52
(f) Speech and drama teacher				V45		53
(g) Remedial teacher				V46		54
(h) Physiotherapist				V47		55
(i) Occupational Therapists				V48		56
(j) Parents				V49		57
(k) Friends				V50		58
(l) Psychologist				V51		59
(m) Dietician				V52		60
(n) The child him/herself				V53		61
(o) None (nobody)				V54		62

13. Should children with auditory processing disorders be treated the same or differently from other children in the class

Same	
Differently	
Uncertain	

V55 [ ] 63

14. Do children with auditory processing disorders outgrow it?

Y	
N	
DN	

V56 [ ] 64

15. Which of the following methods can the teacher use to help children with auditory processing disorders?

	Y	N	DN			
(a) Ignoring the child				V57		65
(b) Punishment				V58		66
(c) Special attention				V59		67
(d) Hearing aids				V60		68
(e) Seating the child at the front row				V61		69
(f) Reducing noise in the classroom by using carpets and curtains				V62		70
(g) Looking straight at the child while speaking				V63		71
(h) Repetition of questions and orders				V64		72
(i) Speaking loud when talking to the child				V65		73
(j) Asking someone to take notes for the child				V66		74
(k) Repeat the information from time to time				V67		75
(l) Check from time to time to see if the child understands				V68		76

SECTION D :

FOR OFFICE USE

PLEASE ANSWER THE FOLLOWING QUESTIONS AND GIVE REASONS FOR YOUR ANSWER WHERE NECESSARY YES [Y] NO [N] UNCERTAIN [UC]

16. During your training as a teacher, did you have lectures/courses on auditory processing disorders? Y / N — V69 — 77

If yes, please describe the nature of the lectures or courses [how many and what did the lectures or courses cover]?

.....

17. Do you think teachers should be trained in auditory processing? Y / N — V70 — 78

If yes, please say why .....

.....

18. Were you aware of auditory processing disorders prior to this project? Y / N — V71 — 79

If yes, how and where? .....

.....

.....

19. Do you think teachers should be trained to treat children with auditory processing disorders? Y / N — V72 — 80

20. If your answer is "YES" for question 19, at which level of training should auditory processing lectures/courses be introduced?

	Y	N	UC			
(a) 1st year				V73		81
(b) 2nd year				V74		82
(c) 3rd year				V75		83
(d) 4th year				V76		84
(e) To newly qualified (in service training)				V77		85

(f) Other, please say what .....

.....

.....

Any other comments .....

.....

.....

.....

.....

APPENDIX IV

University of Pretoria

Pretoria 0002 Republic of South Africa Tel (012) 4202357/4202816
Fax (012) 420-3517 *http://www.up.ac.za*

Department of Communication Pathology
Speech, Voice and Hearing Clinic

24th August 2000

Dear Colleague

I am a masters student at the University of Pretoria, doing some research in areas related to speech-language therapy and teaching. I am specifically interested in children with auditory processing disorders.

When a child hears a sound he must make full use of the sound – that means he must interpret a sound and eventually attach meaning to the sound. Many children are unable to do this – they have an auditory processing disorder.

I appeal for your assistance in this research. The data that I receive should enable to help professionals working with these children, it will extend and improve the service to the children and eventually it will help you as teachers in the classroom to cope with such children.

The questionnaire should not take more than twenty (20) minutes to complete. I also promise to treat all information confidentially and to give feedback after the completion of the research. If there are any questions you do not understand, please mark with an (*) and comment where necessary.

Thank you for your time and co-operation.

Thank you.

Yours faithfully

TINTSWALO HLABANGWANE (MISS)
TH/th

Tel. No.: (011) 984-1517, (013) 653-2182 or 082 686 2060

SUPERVISORS: Prof. R.S. Hugo and Mrs N.G. Campbell

Appendix IV

Covering letter for the questionnaire

University of Pretoria
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Fax (012) 420-3517 http://www.up.ac.za

Department of Communication Pathology
Speech, Voice and Hearing Clinic

Dear Colleague

I am a masters student at the University of Pretoria, doing some research in areas related to speech-language therapy and teaching. I am specifically interested in children with auditory processing disorders.

When a child hears a sound he must make full use of the sound – that means he must interpret a sound and eventually attach meaning to the sound. Many children are unable to do this – they have an auditory processing disorder.

I appeal for your assistance in this research. The data that I receive should enable to help professionals working with these children, it will extend and improve the service to the children and eventually it will help you as teachers in the classroom to cope with such children.

The questionnaire should not take more than twenty (20) minutes to complete. I also promise to treat all information confidentially and to give feedback after the completion of the research.

Thank you for your time and co-operation.

Yours faithfully

TINTSWALO HLABANGWANE
TH/

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