Conductive Hearing Loss and Behaviour Problems Amongst Urban Indigenous Students

Thesis for submission for the degree of PhD in the faculty of Education

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Declaration

I hereby declare that the work herein, now submitted as a thesis for the degree of Doctor of Philosophy by research of the Charles Darwin University, is the result of my investigations, and all references to ideas and work of other researchers have been specifically acknowledged. I hereby certify that the work embodied in this thesis has not already been accepted in substance for any degree, and is not being currently submitted in candidature for any other degree.

Signed: ___________________________ Date: _____________________
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# Table of contents

Abstract i-ii

Table of Figures iii-iv

## SECTION ONE  INTRODUCTION

Chapter 1  Introduction 1-32

## SECTION TWO  LITERATURE REVIEW

Chapter 2  Urban indigenous schooling, teachers, and difference 33-52

Chapter 3  Conductive hearing loss, social justice and Indigenous educational theory 53-68

Chapter 4  Hearing loss and social interaction 69-86

Chapter 5  Background noise in schools 87-96

Chapter 6  Indigenous students, conductive hearing loss and research issues 97-128

## SECTION THREE  METHOD

Chapter 7  Research design 129-159

## SECTION FOUR  RESULTS

Chapter 8  Individual case studies 160-204

Chapter 9  Behaviour problems, hearing loss and background noise 205-250

Chapter 10  Teacher identification of hearing loss 251-261
Abstract

Indigenous people in Australia experience multiple forms of disadvantage. Some of these result in poor educational outcomes, which, in turn, create further disadvantage. While a number of factors have been thought to contribute to the difficulties that Indigenous children encounter at school, the implications of conductive hearing loss have been largely a neglected issue. Conductive hearing loss results from middle ear disease (otitis media).

Indigenous children experience otitis media in more severe forms, earlier and for longer periods during childhood than do other groups of children in Australia. However, there has been a long-standing tendency to regard middle ear disease and the related conductive hearing loss as largely a health issue, despite past research which has demonstrated that conductive hearing loss is associated with school behaviour problems, and with poor learning outcomes for many Indigenous students.

This research project used an embedded case study, mixed methods design to consider issues that are fundamental to the improvement in the educational support available for urban Indigenous students with conductive hearing loss. The project evaluated an informal speech reception game that could be used by teachers and parents to identify the children who may have a current conductive hearing loss. It also examined children’s classroom responses, responses that were often viewed by teachers as behaviour problems, and found that these could be related to students’ current conductive hearing loss.
The research outcomes provide a better understanding of how conductive hearing loss, in conjunction with background noise levels in classrooms, can shape responses by students that teachers identify as behaviour problems. The resulting framework of knowledge can be drawn on to help teachers working with children with current conductive hearing loss. It provides a base for the development of more effective classroom intervention and behaviour management strategies that cater for the communicative and educational needs of the many Indigenous children with conductive hearing loss.
Table of figures

Table 1.1  Classification of hearing loss  p. 8
Table 1.2  Overview of otitis media infection across the population  p. 11
Table 2.1  Relationship focused educational strategies  p. 37
Table 6.1  Research results and cultural context  p. 110
Table 7.1  Research approaches and data types  p. 130
Diagram 7.1  Data types  p. 135
Table 7.2  Audiological assessment results for target students  p. 136
Table 7.3  Themes in the two individual case studies  p. 144
Table 8.1  Characteristics of ADHD and effects of conductive hearing loss  p. 203
Table 9.1  Alana’s verbal interactions during 27 minutes of school assembly  p. 210
Table 9.2  June’s verbal interactions during 17 minutes of school assembly  p. 211
Table 9.3  Kirsty’s verbal interactions during 23 minutes of school assembly  p. 212
Table 9.4  Tina’s verbal interactions at different noise levels during 31 minutes of ‘Work at Tables’  p. 213
Table 9.5  Tina’s verbal interactions during 27 minutes of ‘Silent Writing’  p. 214
Table 9.6  Tina’s proportion of time in verbal interaction in noisy and quiet settings  p. 215
Table 9.7  Renee’s verbal interactions at different noise levels during 19 minutes of class group work  p. 216
Table 9.8  Renee and Tina’s verbal interactions at different noise levels  p. 217
Table 9.9  Time spent in verbal interaction in a noisy corridor  p. 218
Table 9.10  Richard’s verbal interactions at different noise levels during 10 minutes of class time  p. 218
Table 9.11  Richard’s time spent in verbal interactions at different noise levels during 10 minutes of class time  p. 219
Table 9.12  Sam’s verbal interactions during 24 minutes of ‘Work at Tables’  p. 227
Table 9.13  Target student social responses and their relationship to hearing loss  p. 247
Table 9.14  Two patterns of responses among 8 target students  p. 250
Table 10.1  Face-watching during one-to-one interaction  p. 254
Table 10.2  Comparison of the results of the speech reception game ‘Blind Man’s Simon Says’ with the results of the formal hearing assessments in identifying students with current bilateral conductive hearing loss  p. 259
Table 11.1  Comparison of results from WAACHS and this study  p. 268
SECTION ONE

INTRODUCTION

Chapter One

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Introduction

This thesis examines the processes through which urban Indigenous students’ conductive hearing loss can result in school behaviour problems in the Northern Territory and it evaluates a relatively simple, classroom-based way of identifying which students are likely to have a current conductive hearing loss.

The research questions

The research questions addressed in this study are as follows:

- What is the nature of the relationship, identified in the literature, between current conductive hearing loss and school behaviour problems?
- Do any environmental factors mitigate or exacerbate social and behavioural problems?
- What are the factors that may obscure the identification of current conductive hearing loss in cross-cultural classrooms, and is there a simple classroom-based procedure that could be used to identify children with a current hearing loss?

Summary of chapter content

The purpose of this study is to investigate the nature of the known relationship between current hearing loss and school behaviour problems. Another component of the study is the evaluation of a simple classroom based procedure to identify children with current conductive hearing loss.
Chapter Two gives a brief overview of the literature on urban Indigenous education that is relevant to the research questions. Chapter Three considers Indigenous conductive hearing loss as a social justice issue and its role as an unidentified critical factor for Indigenous educational theory. Chapter Four reviews the literature on hearing loss and social interaction. It identifies a variety of social factors that interact with hearing loss in poorly understood ways. While this subject has been of only peripheral interest to researchers, the clear relationship between conductive hearing loss and school behaviour problems, is evident. Chapter Five summarises the research into background noise in schools. Chapter Six describes the small amount of research into social interaction and conductive hearing loss among Indigenous children in some detail. Methodological issues that affect research in this area are also considered. Chapter Seven describes the research design used in this study.

Chapters Eight and Nine present the major findings of this study. Chapter Eight presents two case studies of individual students. Chapter Nine describes the interaction of hearing loss, social interaction and background noise in classrooms. Chapter Ten presents the results of two minor studies that are relevant to teachers’ ability to identify students with current conductive hearing loss. Chapter Eleven discusses the overall findings and the implications of these for educational practice.

Indigenous people are among the most disadvantaged people in Australia. As a group they have poor educational outcomes, they experience more ill health and higher rates of unemployment, and they are hugely over represented in criminal justice system statistics. These different types of disadvantage are linked in ways that are poorly understood. Indigenous children begin their lives with health problems that have an important effect on educational outcomes. Children who are inadequately nourished and
who are often sick find it hard to learn. One of the commonly occurring health problems is middle ear disease. High levels of middle ear disease are associated with poverty. It is endemic among Indigenous children.

Indigenous Australians have one of the highest levels of middle ear disease in the world (Couzos, Metcalf & Murray, 2001). It has been estimated that non-Indigenous children, on average, spend three months during their childhood with middle ear disease. The comparable figure for Indigenous children is 2.6 years. However, the problem is not solely one related to the current hearing loss that the children face. Extensive experience of conductive hearing loss can impair the development of normal auditory processing skills (Bellis, 2002).

Hearing is a highly significant ‘social’ sense and so middle ear disease and the associated hearing and listening problems (conductive hearing loss and auditory processing skills) have important social consequences. Language development depends on hearing. Mainstream schooling systems rely heavily on spoken instruction. The limitations of this form of communication when people have severe to profound levels of hearing loss are obvious. However, people with slight to moderate levels of hearing loss are often an invisible part of the general community. They may not know, or if they do know may not tell others, that they have a hearing problem. Nevertheless, slight to mild hearing loss can have a significant effect on social interaction, especially in adverse listening environments - for example, when there is a lot of background noise or when several people are speaking at the same time. People with mild to moderate listening problems may not encounter communication difficulties, in comparison with someone with normal hearing, when they are talking ‘one-to-one’ and in a quiet environment - an ideal listening environment. Thus, people’s variable capacity to cope in
different listening contexts means that their hearing loss may be hard to identify, and problems related to this may be attributed to other causes.

These are matters that teachers often are not aware of. In particular, Indigenous children, with their high prevalence of conductive hearing loss, may have teachers who have had minimal training on the educational effects of conductive hearing loss. This situation is partly attributable to the poor collaboration between the health and education providers of services to Indigenous children.

Conductive hearing loss is generally the result of middle ear disease which is often viewed as the responsibility of health services. For example, school ear programs have often focused only on the health aspects of ear disease - referral, ear washing, clearing the upper respiratory tract and the provision of information on ear health. However, it is families and schools that face the educational and social consequences of conductive hearing loss. Information to guide the teachers who work with children with conductive hearing loss has often been limited to a few suggestions on classroom seating and ways of getting attention when speaking to the affected students. Teachers who claim some understanding of the issues associated with Indigenous conductive hearing loss often know more about the health issues than they do about the associated educational issues.

For the Indigenous health services, ear disease can appear to be a minor health problem when they are also dealing with more acute, chronic and life threatening health problems. As a result, middle ear disease is often accorded a low priority during the allocation of scarce health resources. Thus, while health professionals may tend to view middle ear disease as a low priority, educators face its educational consequences, but they too may
know more about the health aspects of ear disease than they do about how to deal with the educational consequences of the problem.

In remote communities it is common for as many as 90 per cent of the children to have abnormal middle ears; that is, they have current middle ear infection or perforation or scarring of the eardrum related to past infections (Couzos et al., 2001). In urban classrooms it is typical for up to 50 per cent of the Indigenous children to experience conductive hearing loss at any point in time (Quinn, 1988). The educational impact of the conductive hearing loss that results from this burden of disease continues to be a little understood issue, and also one that is seldom accorded appropriate importance.

In the past ten years there has been almost no research into the impact of hearing loss on the education of Indigenous students. There appear to be a number of reasons for this.

- Hearing loss is often an invisible disability and teachers in classrooms and the literature on Indigenous education tend to focus on the more obvious cultural and language differences that may serve to mask the effects of hearing loss.
- It is a difficult subject to study. In particular, the limited access to audiological data for educational research purposes are a major obstacle, and one that makes it difficult for postgraduate students to attempt research that requires multidisciplinary input.
- Despite the extensive presence of hearing loss among Indigenous students, there are few academics and professionals working in the field with expertise in both Indigenous education and hearing loss.

This is the context within which this research project began. While Indigenous conductive hearing loss is an issue that has been identified as a
major concern for Indigenous education, there were few individuals with expertise in the area, there was little collaboration between the service providers, the relevant knowledge base was limited, and there were major obstacles to conducting research in the field. That situation remains essentially unchanged in 2006.

This research project sought to overcome some of these research obstacles through the use of whole school audiological data from testing being conducted by health agencies at the time. As long-term, well-planned audiological data collection were not possible for this study, the classroom data gathering focused on the collection of the best data available for a short time period after a single audiological assessment had been carried out. The constraints on data gathering meant it had to be opportunistic and pragmatic.

The major component of this thesis considers the ways in which hearing loss contributes to perceived behaviour problems at school. It also considers issues associated with the identification of students with current conductive hearing loss in classroom settings. The latter is essential if programs for children with hearing loss are to be successfully developed and implemented. The relationships that this research uncovers between hearing loss, background noise and classroom behaviour are not intuitively obvious. The research describes, in an initial way, a complex reality that the teachers and students taking part in the research were not aware of. In particular, background noise levels in schools compound the listening difficulties of Indigenous children with current conductive hearing loss.

Previous research (Howard, 1990; Lowell, 1994; Massie, 1999) suggests that hearing loss can affect the educational and social outcomes for Indigenous
children in different ways in different school settings. The most common classroom experience for Indigenous students in Australia is one of urban classrooms with mixed Indigenous and non-Indigenous class groups taught in English by non-Indigenous teachers. This study focuses on conductive hearing loss in this setting. While most Indigenous students are found in this type of school situation, it is also the setting in which there has been the least research into hearing issues that may affect their education.

One focus of the international research on the educational disadvantage experienced by minorities has focused on the cross-cultural aspects of education (Erickson, 1986). Those investigating different dimensions of Indigenous educational disadvantage have focused on the micro-politics of social interaction in the classroom with reference to the macro-economics of social disadvantage (Nicholls, Crowley & Watts, 1996). It is clear that a more multi-dimensional model of educational disadvantage is needed. However, it is difficult for researchers to span the many different dimensions of learning in a single project.

With that in mind, this study focused on the social dynamics of classrooms. It did not explore the ‘out of school socio-political’ factors that affect Indigenous educational disadvantage. However, while out-of-school disadvantage was not considered in the data gathering, the results have implications for other components of Indigenous disadvantage. Middle ear disease and the associated hearing loss are common among disadvantaged groups around the world. Socio-economic disadvantage affects the quality of housing, nutrition and access to medical care. These, in turn, are associated with higher rates of middle ear disease and the related hearing loss. This suggests that a cycle of educational disadvantage exists, whereby macro levels of socio-economic disadvantage contribute to extensive hearing loss.
which in turn affects micro-political classroom processes, which then result in educational disadvantage. Poor educational outcomes then contribute to the perpetuation of socio-economic disadvantage.

The remainder of this chapter describes the different types of hearing loss and its prevalence among Indigenous students. It reviews the ways in which hearing loss has been thought to impact on educational outcomes, as well as the problems of service provision and research in this field. Finally, it describes the author’s interest in the subject and outlines the content of the other chapters in this thesis.

**Types and prevalence of hearing loss**

Sound is perceived after it is transmitted through the outer ear and the middle ear, and then along nerve pathways to the brain. Hearing loss can result from damage or obstruction at any point of this transmission process. Levels of hearing loss range from slight to profound as outlined in Table 1.1.

<table>
<thead>
<tr>
<th>Classification of Hearing Loss</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Slight hearing loss</strong> (15 dB to 25 dB)</td>
<td>Some difficulty in noisy environments.</td>
</tr>
<tr>
<td><strong>Mild hearing loss</strong> (25 dB to 40 dB)</td>
<td>Unable to hear soft sounds, difficulty understanding speech clearly in noisy environments.</td>
</tr>
<tr>
<td><strong>Moderate hearing loss</strong> (41 dB to 70 dB)</td>
<td>Unable to hear soft and moderately loud sounds, considerable difficulty understanding speech, particularly with background noise.</td>
</tr>
<tr>
<td><strong>Severe hearing loss</strong> (70 dB to 90 dB)</td>
<td>Some loud sounds are audible but communication reliant on lip reading, signing and amplification (hearing aids).</td>
</tr>
<tr>
<td><strong>Profound hearing loss (90 dB and above)</strong></td>
<td>Some extremely loud sounds are audible. Communication reliant on lip reading, sign language and hearing aids.</td>
</tr>
</tbody>
</table>
The degree of functional difficulty experienced by a person is not related only to their level of hearing loss. People bring a range of skills to the task of listening that help to improve speech perception. The speech perception of a person who has a good understanding of the language being spoken, as well as the cultural context of the topic being discussed, will be better than that of someone who is less familiar with the language and/or cultural context. This means that an Indigenous student with a mild hearing loss who speaks English as a second language or non-standard English will have greater functional difficulties in speech perception than a non-Indigenous Standard English speaking adult with the same decibel hearing loss.

Damage to the nerve pathways needed for the transmission of sound is termed *sensori-neural hearing loss*. This type of hearing loss is usually permanent and often severe; the level of the hearing loss is significant. Most services for those with hearing loss (for example audiological services and teachers of the deaf) have been developed to address the needs of individuals with this type of hearing loss. These services are generally individual in their approach and expensive; for example, the fitting of hearing aids, instruction in small groups and medical intervention. Because of the small number of children affected by significant sensori-neural hearing loss these programs, while expensive, have been viable.

Hearing loss caused by problems with the transmission of sound impulses before they enter the nerve pathways is called *conductive hearing loss*. The term applies to the mechanical conduction of sound through the vibration of the eardrum (tympanic membrane) and the pressurisation of air in the middle ear. Conductive hearing loss is most commonly caused by infections of the middle ear.
*Otitis media* (inflammation of the middle ear) is a term used for a number of conditions that affect the middle ear. The period of *acute otitis media* is generally defined as the first three weeks of a middle ear infection. It is usually accompanied by pain, decreased hearing, and sometimes fever. *Subacute otitis media* is defined as a middle ear inflammation that lasts for three to eight weeks and is usually asymptomatic, except for a mild conductive hearing loss associated with the presence of fluid in the middle ear. The fluid obstructs the conduction of sound through the middle ear. *Chronic otitis media* is middle ear inflammation that lasts longer than eight weeks. Fluid may or may not be present in the middle ear. When fluid is present in the middle ear for at least eight weeks without any discharge from the ear through the eardrum, the condition is referred to as *chronic otitis media with effusion*. After the onset of acute otitis media, fluid may persist in the middle ear space for varying periods of time. An unresolved condition where the fluid remains in the middle ear space for longer than two weeks is known as *persistent otitis media with effusion*. When infections of the middle ear occur repeatedly, the condition is referred to as *recurrent otitis media*. When the ear drum bursts through the build up of pressure from the fluid, the ear drum is said to have a perforation and may develop *chronic suppurative otitis media*. Perforations of the eardrum contribute to conductive hearing loss. Perforations are much more common among Indigenous children and there is generally a different pattern of ear disease in the Indigenous and non-Indigenous community as is outlined in Table 1.2.
Table 1.2  Overview of otitis media infection across the population

<table>
<thead>
<tr>
<th></th>
<th>Otitis media with effusion</th>
<th>Acute otitis media</th>
<th>Chronic suppurative otitis media</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Fluid behind the middle ear that is often asymptomatic</td>
<td>Active infection of recent onset often with pain</td>
<td>Persistent discharge from middle ear through a perforation</td>
</tr>
<tr>
<td>Non-Indigenous children</td>
<td>Common</td>
<td>Common, but usually not recurrent</td>
<td>Uncommon</td>
</tr>
<tr>
<td>Indigenous children</td>
<td>Very common, often appears in first weeks of life</td>
<td>Very common, high rate of recurrence</td>
<td>Very common in remote areas, but less common in urban areas</td>
</tr>
</tbody>
</table>

Adapted from Snodgrass (2006, p.7).

To summarise, *otitis media with effusion* refers to the presence of fluid in the middle ear without any signs or symptoms of infection. The presence of fluid in the middle ear and perforations of the ear drum caused by a build up of fluid, inhibit sound being conducted through the middle ear and result in conductive hearing loss. The hearing loss associated with otitis media can last for up to six months, and it can fluctuate through this period.

The hearing loss that results from conductive hearing loss is usually slight to mild (10 dB to 30 dB), and is often not evident to parents and teachers. Moore and Best (1980) found that 30 per cent of early childhood students in five Melbourne schools had some level of unrecognised hearing impairment. While this type of conductive hearing loss is usually mild, temporary and fluctuating, it affects many more children than sensori-neural hearing loss. In developed countries it mostly affects pre-school age children.

In contrast with the focus on sensori-neural hearing loss, there has been little educational focus on children who have been affected by conductive hearing
loss. It is often an invisible problem. Even when the problem is identified, as a temporary condition without clear educational implications, it is easily ignored. The resource intensive, high-technology strategies used with sensori-neural hearing loss are neither appropriate nor viable with the larger numbers of children affected by conductive hearing loss.

Certain factors appear to contribute to the prevalence of childhood otitis media. These include overcrowded housing, poor nutrition, and limited medical attention (Kamien, 1975). Students affected by conductive hearing loss often come from disadvantaged backgrounds. Other risk factors include age, sibling history, ethnicity, season, the type of day-care, early feeding practices, parental smoking, social and physical environments, allergies, and some children may be anatomically predisposed to this type of infection (Haggard & Hughes, 1991).

Hearing loss and related middle ear dysfunction is generally identified using three forms of assessment.

The first is pure tone audiometry. A child is presented with pure tones of sound at differing frequencies and amplitudes. The child’s ability to hear particular sounds is described in decibels. A hearing loss of 25 dB has generally been considered as the level at which a hearing loss becomes significant for a child. However, McPherson (1995) suggested that for Indigenous children a hearing loss of 15 dB should be considered significant, because linguistic and cultural factors present additional barriers to communication.

The second is tympanometry. The status of the middle ear is assessed by measuring the pressure within the middle ear. This gives an indication of normal or abnormal functioning.
The third, *otoscopy*, involves a visual examination of the ear canal and eardrum. This examination may reveal infection or otoscopic abnormalities such as current perforation of the eardrum or scarring that is indicative of past perforations.

Studies of the prevalence of hearing loss often draw on varying combinations of these different assessment techniques. Schools may not have access to the resources needed assess the presence of conductive hearing loss using these techniques. This makes it difficult for them to identify children with current hearing loss.

Otitis media is common in a wide range of populations (Moore & Best, 1980). In the USA it is the most common ‘presenting problem’ among children seen by general practitioners (Au & Jordon, 1981). It has also been found to be highly prevalent among Indigenous populations world-wide, including those in Australia. In many remote communities with a high level of middle ear disease only 10 per cent of the children have normal hearing in both ears (Couzos et al., 2001). Indigenous children also experience their first episodes of middle ear disease at an early age. In a prospective study of otitis media and conductive hearing loss in Indigenous children, otitis media was observed in Indigenous infants as young as eight days old; by four months of age almost all had experienced episodes of otitis media. In comparison, only nine of 17 non-Indigenous infants had experienced episodes of otitis media during their first six months (Boswell, Leach, Nienhuys, Kemp & Mathews, 1993).

McCafferty, Lewis, Coman and Mills (1985) completed the most extensive study of the prevalence of hearing loss among Indigenous groups in
Australia. In a longitudinal study conducted over nine years in a Queensland community they described five patterns of aural status. These patterns were based on tympanometry and otoscopy. Actual hearing levels were not tested. This study highlighted both a greater predisposition to, and persistence of otitis media among Indigenous children. Twenty per cent of Indigenous children had almost permanent middle ear disease, and a further 40 per cent had regular occurrences of middle ear disease. Only 37 per cent were predominantly free of middle ear disease.

For many Western children, especially those with good access to medical treatment, middle ear disease and the associated conductive hearing loss have generally been resolved by the time children arrive at school. However, for many Indigenous children fluctuating conductive hearing loss continues during their school years, and especially the early years of schooling. For these children, current hearing loss often compounds the linguistic, cognitive and social problems caused by previous periods of hearing loss (McPherson, 1995).

The prevalence of ear disease and hearing loss is different in different Indigenous communities. Sunderman and Dyer (1984) reported that in the Kimberly region 81 per cent of the ears examined were clinically abnormal. A survey of both children and adults in two bush communities and one urban community found that the incidence of ear perforations in one bush community was 17.3 per cent, and 20.3 per cent in the other. The prevalence of mild hearing loss in these two bush communities was 27.7 per cent and 32.2 per cent respectively. The prevalence of mild hearing loss in the urban community was 16.5 per cent. While the incidence of hearing impairment was significantly less in the urban community, the rate there was still higher than the rates for the wider community.
McPherson and Knox (1992) compared the hearing and middle ear status of Indigenous and non-Indigenous children living in an urban area. Eleven per cent of the Aboriginal and Torres Strait Islander children’s ears failed the tympanometry assessment or were perforated, and 20 per cent had signs of previous middle ear disease on otoscopic examination. In contrast, seven per cent of the non-Indigenous group failed the tympanometry test and 10 per cent had signs of earlier ear disease (McPherson & Knox, 1992). Mild hearing loss was most common in early childhood and its prevalence decreased with age. While it is less prevalent among urban Indigenous people, it is still more common among them than among the non-Indigenous population.

In the Northern Territory, Quinn (1988) found that 25 to 50 per cent of Indigenous school children have a conductive hearing loss that is greater than 25 dB in one or both ears at any time, and the average prevalence of perforated eardrums in the surveyed Indigenous schools was 30 per cent.

In summary, Australian Indigenous children are likely to experience hearing impairment from a younger age (Boswell et al., 1993) and for longer periods (McCafferty et al., 1985) than other children in Australia. The prevalence of hearing impairment is greatest in early childhood and decreases with age. Its prevalence is greatest among children living in remote communities, but urban Indigenous children also experience rates of hearing loss that are higher than their non-Indigenous urban peers. Where conductive hearing loss is endemic it can also lead onto a secondary listening problem, an auditory processing problem.

**Auditory processing problems**

Auditory processing has been described as ‘what we do with what we hear’. When the research data were gathered for this study, little was known about this subject.
To derive meaning from words our neurological system must process the sound that we hear. Knowledge of the importance of auditory processing has only developed since the 1960s, and it is only in the last ten years that a widespread understanding of the issues has emerged in the educational arena.

Auditory processing problems can contribute to problems with the perception of speech. Auditory processing problems are not detected by standard hearing tests. There are specific assessments to identify auditory processing deficits (Bellis, 2002). These involve tests that include listening to words in the presence of background noise, or to different words presented individually to each ear.

Auditory processing problems can affect speech perception in a number of ways (Bellis, 2002). People with auditory processing problems may have a diminished ability to differentiate between sounds; that is, limited auditory discrimination skills. This difficulty has implications for their understanding of what is said, their ability to follow directions and their capacity to learn to read and spell. People may also have difficulties with their auditory memory and find it difficult to remember information presented in spoken form. Another common problem for people with auditory processing difficulties is their ability to listen in the presence of background noise. While people may cope with communication one-to-one in a quiet environment, they can have difficulties when there is background noise and when more than one person is speaking at the same time.

Some of the signs of auditory processing problems are as follows (Patton, 2004). People may:
• interpret words too literally;
• often need remarks repeated;
• ask many extra informational questions;
• have difficulty following a series of directions;
• have difficulty remembering information presented verbally;
• hear better when watching the speaker; and/or
• have problems with background noise.

Initially it was thought that auditory processing problems were mostly either genetically determined or the result of head injury. However, research is increasingly supporting the view that early mild hearing loss from middle ear disease may result in auditory processing problems that can be persistent or permanent (Hogan & Moore, 2003). Research also suggests that it is the cumulative total of hearing loss experienced by children that is the critical factor in the development of auditory processing problems. Since Indigenous children experience middle ear disease and associated hearing loss both earlier and longer than other groups, the risk that they will develop auditory processing problems is high.

Between seven and 10 per cent of the general population are thought to be affected by auditory processing problems (Hogan & Moore, 2003; Rowe, Rowe & Pollard, 2001). However, in a study involving six Northern Territory independent schools and 1,050 Indigenous secondary students, 38 per cent showed signs of auditory processing problems (Yonovitz & Yonovitz, 2000). This study was based on secondary school students who attended school, so students who had left school because of problems related to listening or who were not attending because of hearing related problems (Couzos, 2004) were not included. It is likely, therefore, that the findings in this study underestimate the proportion of Indigenous secondary school age students with auditory processing problems.
The only other study to date on Indigenous auditory processing was conducted by Aithal, Yonovitz and Aithal (2004). They compared auditory processing abilities among a group of Indigenous children with a known history of otitis media with those of non-Indigenous children with no history of otitis media. The affected Indigenous children had significantly lower auditory processing skills than the non-Indigenous children with no history of middle ear disease. This suggests that many Indigenous children with a history of middle ear disease will have auditory processing problems that are likely to affect their education.

In a group of school age children with current conductive hearing loss, such as the target students in this study, it can not be assumed that any observed problems stem only from their current hearing loss. It is probable that the children selected for a ‘one-off’ hearing test will include children who have experienced persistent hearing loss and have associated auditory processing problems.

**Conductive hearing loss and Indigenous education**

None of the major theories about Indigenous education has considered endemic Indigenous hearing loss as a factor that affects Indigenous educational outcomes. As a result, the topic of conductive hearing loss and its implications for Indigenous education theory, policy and practice is often marginalised as a special education issue. Special education, where service delivery usually assumes individual support to a small number of students, is not a model that can cope with the widespread prevalence of Indigenous conductive hearing loss.

In the absence of relevant research among Indigenous students, the perceived need for supplementary educational support is based on the
outcomes of research carried out with Western populations. However, Western children experience far lower prevalence and persistence of middle ear disease, as well as fewer of the factors likely to exacerbate the educational consequences of conductive hearing loss. This means that the assumptions on which the educational needs analysis for children with conductive hearing loss are based, have limited applicability for Indigenous children.

School learning depends greatly on spoken instruction, and this is increasingly so as a child progresses through the grades. It could be expected that children who have hearing loss that limits their verbal learning capacity will attempt to compensate for this by using visual cues. There is some support for this idea. Sak and Ruben (1981) found that otitis media-positive subjects had a significantly stronger visual sequential memory, and this may help them to cope with their diminished auditory input.

It has also been suggested that children with a history of conductive hearing loss will experience less educational disadvantage when additional visual cues are available in classrooms to offset the potential difficulties they face when processing auditory input (Menyuk, 1980). Indigenous children have a strong visual orientation to learning (Harris, 1980; Jacobs, 1986). It is not known, however, whether this is a culturally based learning orientation or one that has been influenced by the endemic hearing loss among Indigenous children.

Harris (1990) pointed out that as an Indigenous child moves through school there are increasing demands on learning through verbal interaction. Hearing loss may have less impact on progression through the early grades, but may act to limit achievement in and beyond upper primary levels, when visual compensation strategies become less effective. This hypothesis is
supported by research (Howard, 2004), which found a significant association between hearing loss and lower achievement among Indigenous children in upper primary grades, but not in early childhood classes. Thus, the widely acknowledged limited educational outcomes among Indigenous children may reflect a ‘learning ceiling’ that is constructed by the outcomes of widespread middle ear disease and limited utility of visual learning strategies in upper primary grades and high school.

Literacy is central to educational achievement in upper primary grades and beyond, and there are indications that hearing loss has an impact on the acquisition of literacy skills. Difficulties with literacy acquisition may be related to difficulties in discriminating between sounds, and with the blending and sequencing of sounds. This can lead on to difficulties with the phonic aspects of reading, a limited understanding and use of grammar, misinterpretation of questions, and difficulty with verbal expression (Webster, 1983). A limited understanding of the rules of oral language is also detrimental to the development of written language (Menyuk, 1980). In a longitudinal study, Silva, Chalmers and Stewart (1986) found that reading scores were significantly and consistently depressed in a group of children who experienced bilateral otitis media, when compared with the scores for a control group.

Yonovitz and Yonovitz (2000) hypothesised that the acquisition of English literacy is more difficult for Indigenous children with a history of conductive hearing loss because of the absence of certain sounds in Indigenous languages, sounds that conductive hearing loss also makes it more difficult for them to hear. They found that phonological awareness programs helped literacy acquisition by Indigenous children. However, the extent to which conductive hearing loss contributes to educational disadvantage through
other than linguistic pathways has been little explored. It is possible that the
effects of hearing loss on social interaction, which is an even more primary
building block of learning than literacy, may also contribute to educational
disadvantage. The recent West Australian Aboriginal Child Health Survey
(Zubrick et al., 2006) provides strong support for this proposition. The study
found that serious middle ear disease was associated with poor social and
emotional outcomes which, in turn, were associated with poor educational
outcomes.

A further concern in Indigenous classrooms is the possible effect of hearing
loss on students with normal hearing when a high proportion of a class
group are affected by hearing loss. The only formal research in this area
indicates that diminished educational opportunities can result for non-
hearing impaired children when a high proportion of their class peers are
affected by hearing loss (Howard, 1990). This study described that demands
on teacher time to provide individualised help or manage disruptive
behaviour, had the effect of limiting other students’ access to support from
the teacher.

**Research issues: the educational effects of conductive hearing loss**

To date, studies of the educational effects of conductive hearing loss have
been language focused and the results have been somewhat inconclusive,
possibly because important mediating factors such as social interaction are
not well understood. Also, there has been a medical rationale for most of the
research. The focus has been on the extent to which early conductive hearing
loss has negative educational consequences that would justify more
aggressive medical management of what is otherwise seen as a common, but
minor health problem.
This medical rationale for the research is reflected in the way it has been reported; mainly in medical and health journals. The common assumption has been that any consequences from early hearing loss are likely to be linguistic, so linguistic sequelae have been explored as people have sought to answer the associated research questions. When cognitive and social development have been considered, they have been assumed to be peripheral issues resulting because language delays also mediate problems in these areas. The possibility that the social problems can themselves mediate language or educational problems has not been considered, despite the fact that language development is essentially a social process.

Given the language-centric nature of Western schooling, the assumption of the primacy of language is a very plausible one for educators. However, the attempt to establish a link between early conductive hearing loss and later language development has been fraught with difficulty and to date, somewhat inconclusive (Haggard & Hughes, 1991). A tangle of interacting issues may need to be unravelled to gain some understanding of the complexity of results.

One difficulty in carrying out the research needed to unravel these complex interactions is that the research must be multi-disciplinary and multi-sectorial. It has to consider health and education systems, as well as encompass a number of different professional disciplines; medical specialists, audiologists, teachers, teachers of the deaf, speech pathologists, psychologists, and more. Furthermore, the target group has a different cultural base from that of most of the individuals in these professions. Not surprisingly, cross-sectoral, multi-disciplinary, and cross-cultural collaboration is difficult to achieve, especially within academic programs that assume a single researcher. This, perhaps, partly explains the paucity of past
research on the educational issues related to hearing loss. Such research is further complicated by the range of other inter-related factors that can have an impact on a child’s social responses in a classroom.

Factors that interact with hearing loss

Haggard and Hughes (1991), in their review of the literature, point to fifteen factors that may interact with otitis media to determine developmental outcomes for non-Indigenous children. These can be categorised as factors that relate to the social environment and to the individual. Factors related to the social environment are the size of a class, the number and age of siblings, economic and social stability, parental involvement in schooling and, finally, background noise. While all of these elements of the social environment deserve consideration, background noise is of particular interest in this study. Background noise is partly determined by the social environment (the more children the more noise), but also by physical aspects of the environment.

Factors related to the individual include literacy level and communication style, visual acuity, innate language ability, general health and nutrition, and the general quality of their education (Haggard & Hughes, 1991). These factors may combine and interact, in ways that are currently not understood, to mitigate or increase the risk of adverse educational outcomes being associated with conductive hearing loss.

The quantitative studies that typify research in this field have identified many of the relevant factors but have been less successful in describing how they interact with conductive hearing loss. Haggard and Hughes (1991) recommended small qualitative studies to clarify the way in which these other factors interact with hearing loss. That recommendation lies behind the
design of this research project. A better understanding of the way these factors interact may provide opportunities for improved intervention strategies. These might target class sizes, levels of background noise, parental involvement in schooling and even general health.

However, if intervention is to be effective, intervention strategies must be well-designed. For this, there needs to be a better understanding of the way the various factors interact with hearing loss and with each other. Factors such as the number and age of siblings, visual acuity and innate language ability are fixed. However, they may be relevant in the identification of individuals at greater risk of adverse outcomes associated with conductive hearing loss. It is already clear from existing research that Indigenous children are among those most at risk. However, educational intervention strategies can only be effective when the at-risk individuals with a current hearing loss can be identified.

**Identification of hearing loss**

Because conductive hearing loss fluctuates, irregular screenings of hearing status do not adequately monitor conductive hearing loss. However, more regular screenings demand resources, and conductive hearing loss is not a priority in comparison with the all too many life-threatening chronic and acute Indigenous health conditions. In these circumstances, the design and implementation of educational programs to deal with the problem will depend on there being a simple, effective means of identifying students with conductive hearing loss.

Teachers and parents are the major sources of referral for formal hearing assessments. McPherson (1995), in his study on the identification of Indigenous children’s hearing loss, noted that teachers find it difficult to
identify the students with current hearing loss. Among non-Indigenous students, he reported that teachers often correctly identified only 25 per cent of the students with a current hearing loss (McPherson, 1995). Interestingly, McPherson concluded that teachers identified social problems with peers as the most prominent issue when identifying the students with a current hearing loss.

One component of this study is an assessment of the obstacles that face teachers who want to identify the students with a current hearing loss, and the evaluation of one technique that they can use to do so. The resulting informal screening test was evaluated during the course of this study.

Such screening devices are needed, in part, because non-Indigenous teachers may have difficulties when trying to assess the extent to which Indigenous students pay attention in class. In one remote community Lowell (1994) found that attentional style among Indigenous students was different from what was expected by non-Indigenous teachers. Non-Indigenous teachers regard students who do not make eye contact and who move around when listening as inattentive. However, Lowell concluded that Indigenous students demonstrating these behaviours were paying attention, but not in the way expected by the non-Indigenous teachers. These findings elaborate on work by Harris (1987) on cultural differences in listening behaviours. Lowell’s work provides further evidence that hearing loss compounds the cultural differences that shape listening behaviours. The visually compensating behaviours (sitting still and watching) of some Indigenous students, usually those with a consistent hearing loss, can mean that non-Indigenous teachers will falsely identify these students as having ‘good’ hearing because they think they are attentive.
In such ways, cross-cultural misperceptions can introduce systematic errors that undermine non-Indigenous teachers’ efforts to identify Indigenous students with a current hearing loss. Their inaccurate perceptions of what constitutes ‘paying attention’ may mean that Indigenous children with good hearing are referred for hearing assessment, while the compensatory visual attentiveness demonstrated by children with conductive hearing loss may lead teachers to believe that these children are hearing well.

However, since Lowell’s (1994) work was carried out with Indigenous children living in what are often described as ‘traditional or customary’ lifestyles, there is no evidence that culturally-based differences in attentional styles also exist among urban Indigenous students who have had far more contact with non-Indigenous society. This study tests this proposition.

A particular Indigenous attentional style among urban children could be expected on the basis of Malin’s work (1989, 1990). Malin found that urban Indigenous people in Adelaide maintained the continuity of some of the social aspects of their culture, such as child rearing, that were often seen among Indigenous people leading more ‘traditional’ lifestyles (Harris, 1980).

**A multi-disciplinary problem**

Hearing loss is a health problem with educational consequences. However, when addressing the educational issues related to the health problem, a health focus has often dominated the discussion of the issues. Preston (1994) described how research on the subject of otitis media has concentrated on epidemiological descriptions of the incidence and prevalence of ear disease and hearing loss among Aboriginal and Torres Strait Islander children from remote communities. There is limited knowledge about the way otitis media
impacts on schooling and how best to educationally support Indigenous students affected by current or past conductive hearing loss.

The concerns about what is clearly a major school problem, when combined with limited knowledge about appropriate school intervention strategies, have often resulted in programs in schools that focus on the medical and audiological aspects of the problem. For example, a major focus of the Northern Territory Hearing Program has been to teach parents and teachers about otitis media and conductive hearing loss, and sometimes to assist with medical treatment. If the educational consequences of conductive hearing loss are to be addressed, there is a need for a body of knowledge to inform the practice of teachers and schools.

The multi-disciplinary and cross-cultural nature of service provision and research in this area also presents a variety of obstacles to the identification of the problem and appropriate remedial action. These obstacles include the poorly developed interface between the health and education systems, professional rivalry, few formal professional avenues of communication or collaboration, and unequal status between professions that can result in domination by the professions with the highest perceived status. Even where multi-disciplinary input is available, it can be difficult to achieve good communication among the professionals who are involved, let alone arrive at mutually agreed perspectives. Cross-cultural communication problems between professionals and clients add another dimension to this professional Tower of Babel.

Although hearing loss has been identified as a major issue for Indigenous educational outcomes, most recently in a report by the Northern Territory Department of Education (1999), there has been remarkably little formal
educational research and few successful intervention programs to deal with the problem. The educational solutions are largely restricted to sound amplification and some classroom advice on ways of improving communication. There is a danger that if teachers are aware of the problem but do not have clear directions for action, it may be counterproductive. In this situation, teachers may lapse into professional inertia when they are swamped by information based on health perspectives and demoralised by the lack of educational direction.

Teachers’ difficulties in identifying affected children are compounded by the fluctuating nature of conductive hearing loss and their dependence on health professionals to carry out formal hearing tests. If they can not accurately identify the children with hearing loss, it is hard for teachers and schools to take ‘ownership’ of hearing loss, as an educational issue. When they must depend on non-educational services to identify the problem there are practical obstacles to progress, and this reinforces the view that this is primarily a health, not an education problem. Unless teachers have identification processes that they can use and that are within their control, hearing loss may continue to be seen as mainly a health problem.

**Development of the research focus**

The paucity of research into the educational effects of conductive hearing loss makes it difficult to prioritise the topics deserving of investigation. A number of possibilities were initially considered. Among them were the interactions between culture and hearing loss and, in particular, how schools might be able to assist Indigenous students with hearing loss, if they can become more culturally responsive. I explored this issue is some earlier writing (Howard, 1994). I was also interested in how schools could best deploy Indigenous staff to provide support to Indigenous children with
hearing loss. The relationship between learning, achievement and hearing loss was another topic deemed worthy of investigation.

Ultimately, a focus on social relationships and the identification of hearing loss emerged as a central concern. My background as a teacher and school psychologist predisposed me to an interest in social relationships and behaviour problems. As with so many issues associated with conductive hearing loss, this topic had seldom been researched among Indigenous and non-Indigenous students. The specific focus on the combined influences of conductive hearing loss and background noise emerged from the data in the course of the study.

My interest in the identification of hearing loss came from a realisation that this was a critical problem that must be solved if support programs were to be effective. Ian Anderson, an Indigenous health researcher, observed (personal communication, 2000) that in Indigenous health research there are key gaps in knowledge that must be investigated before research can focus on what is needed to promote capacity building in educational service provision for Indigenous students. An ability to identify students with hearing loss in the classroom is one such critical gap. It inhibits the development of educational services that will help Indigenous students with hearing loss.

**Personal interest of researcher**

As a teacher and school psychologist in remote and urban schools I became aware of the problems facing Indigenous students. The contribution of hearing loss to these problems became an abiding interest. My original recognition of hearing loss as an issue was stimulated by contact with Anne Jacobs, a speech pathologist, who undertook some of the original research
into the outcomes of hearing loss among Indigenous children. Her quiet passion stimulated a desire in me to investigate this issue. After initial research into the impact of hearing loss in classrooms (Howard, 1990), I undertook further research in two remote schools (Howard, 2004). I began this study during 1991, with the support of a study award from my employer, the Northern Territory Education Department. However, in 1992 I left the Education Department to begin work as a psychologist in the private sector, although I maintained my interest in the subject area and continued to train teachers and school psychologists in these subjects.

In private practice, my work brought me into contact with many Indigenous adults with both identified and unidentified hearing loss. Among many long-term unemployed Indigenous people, I found that hearing loss was associated with high levels of dependence on family members when dealing with people outside the family. People also told stories of losing jobs and of social problems because they couldn’t hear normally. Hearing loss also appeared to have affected some individuals who had become involved with the criminal justice and mental health systems. Among those who had experience of the mental health system, I observed communication difficulties related to hearing loss (usually unidentified) that appeared to have contributed to what were seen as solely mental health issues. In the criminal justice system I encountered some of the students who had previously been identified as having had hearing and social problems in schools. The communicative and social problems first evident in school had later escalated and led to behaviour that had predicated their involvement in the criminal justice system. The most distressing aspect of this hearing loss for some of the Indigenous people I came into contact with was the effect they knew it had had on their family life. It had impaired their ability to relate and connect with family members in group situations. The degree of
social ‘connectedness’ of Indigenous people with members of their family meant that the disconnection with their family because of their impaired hearing was deeply felt.

This professional experience served to highlight the role that hearing loss can play in a variety of the areas of disadvantage that are evident among Indigenous adults and that, to date, have not been fully investigated. However, the research for, and work on this study was hindered by the need to earn an income. A scholarship provided by the Co-operative Research Centre for Tropical Health enabled me to continue with the work, eventually. In returning to it, I was struck by the number of people who have left this field of endeavour. Most of the cohort of interested and talented professionals working in the field when my involvement began in the late 1980s are now working elsewhere, often harbouring an unrequited desire to achieve the seemingly elusive outcomes that may come from research into these subjects.

Anne Lowell, whose work will be mentioned often in this document, has focused her considerable talent as a cross-cultural researcher on other topics. Ian Henderson, who pioneered some innovative service provision strategies in the 1980s, has directed his entrepreneurial skills elsewhere. Anne Jacobs, who undertook a seminal study on Indigenous language development and the effects of conductive hearing loss, as well as developing early resource materials for teachers, continues to work in the area, but on a voluntary and very part-time basis. Sue Quinn, who conducted some of the original prevalence studies to identify the extent of the problem, is now working on other things. Ann Sinclair, who co-ordinated the development of an innovative kit for schools on the subject of otitis media, is also now working on other things.
Why has this ‘brain drain’ happened? It is not because commitment has been wanting. It has been there in abundance, among many interested professionals. Instead, it has been the lack of opportunity and a sense of frustration that has led people to move on to things that are professionally and personally more rewarding. The commitment of individuals has foundered on the apparent lack of interest at a ‘system’ level. The reason for this lack of interest is unclear. Perhaps part of the answer lies in the multi-disciplinary nature of the research. A cross-discipline problem easily becomes ‘no-one’s problem’. For educators, it is easier to regard conductive hearing loss as a health problem. For health professionals, conductive hearing loss rates low on the range of acute, chronic, debilitating, or life threatening Indigenous health issues. As an educational research issue, there are now fewer people with the appropriate interest or expertise to do the much needed work on the effects of hearing loss among Indigenous children.

On my return to this field of work, to complete this study, I found a new group of researchers; fewer in number but mostly facing the same obstacles and often perplexed by the seeming difficulty of achieving tangible results. I also found a new group of educators concerned about problems they see in classrooms that the experts tell them should not exist, on the basis of available international research which has limited relevance to Indigenous children. And in classrooms throughout Australia, children still respond in the ways described in this study and teachers still struggle with what they can do to help them.
SECTION TWO

LITERATURE REVIEW

Chapter Two

Urban indigenous schooling, teachers, and difference
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Urban Indigenous schooling, teachers, and difference

Indigenous children in Australia attend school in a variety of school settings. A few attend remote bilingual schools where they are taught by an Indigenous teacher in a wholly Indigenous class group. More common in remote communities are English language based programs taught by non-Indigenous teachers in wholly Indigenous classes. However, the school setting for the majority of Indigenous children in Australia is an urban school, where they are taught by a non-Indigenous teacher in a class group where they are a minority within the class.

These three school contexts can be seen to be on a continuum of cross-cultural schooling experienced by Indigenous students. Bilingual schools present the fewest cross-cultural school challenges. Urban mainstream schools present the most. The results of the research referred to Chapter One indicate that Indigenous children with hearing loss experience greater difficulty in urban cross-cultural school settings.

There are recurrent themes that emerge in the findings of different researchers such as the importance of social relationships and the way culture shapes social relationships centred on learning. This suggests that educational outcomes for Indigenous students are shaped by the way schools enable or obstruct the development of positive social relationships as a platform for learning. The schools themselves, as institutions, as well as
individual teachers, can facilitate or block the changes that are needed to
cater better for the needs of Indigenous students. These particular needs
derive in part from cultural backgrounds that are different from those of
most of the other students and the vast majority of teachers. Research shows
that teachers’ attitudes towards, and beliefs about students who are
‘different’ influence the educational opportunities and outcomes for these
children. Culture also influences the ways in which non-Indigenous teachers
see the Indigenous children as ‘different’. Among the Indigenous students,
those with hearing loss are the most likely to seem most different.

**Urban Indigenous schooling**

Much of the early research in Indigenous education focused on Indigenous
students in remote schools (Harris, 1980; Christie, 1986). These school
contexts, where classes are made up of only Indigenous students, and which
often have an Indigenous teaching assistant, are quite different from the
urban schools where there is a majority of non-Indigenous students in class
groups taught by non-Indigenous teachers. In recent years, however,
researchers have begun to consider issues affecting urban Indigenous
students in urban mainstream schools.

Malin (1989) conducted an in-depth ethnographic study of two classrooms in
Adelaide. Harris and Malin (1994) investigated teacher perceptions of
Indigenous education among urban school students in Darwin. Hudspith
(1996) conducted an ethnographic study of several urban classrooms in
Darwin. In Western Australia, Partington and his co-workers (Partington,
Harrison, Godfrey & Wyatt, 1997; Partington, Richer, Godfrey, Harslett &
Harrison, 1999) investigated teacher and parent perceptions of what
constitutes high quality Indigenous education. McRae (2000) described and
evaluated the outcomes of Commonwealth funded projects in Indigenous education.

Malin (1997) described the educational exclusion that could result from cultural differences that undermine Indigenous students’ relationships with their teacher. The culturally based incompatibilities in the social expectations of Indigenous children and their non-Indigenous teacher detrimentally affect the teacher-student relationship. The sophisticated social skills which Nunga students living in urban Adelaide brought to school were seen as a threat rather than an asset. These skills included:

- monitoring the whole classroom social context rather than simply focusing on the teacher;
- engaging collaboratively with other students rather than being individually focused;
- seeing themselves as achieving collectively, even when the class was not organised this way;
- sending positive, often non-verbal messages, to fellow students; and
- acting as interpreters to problem-solve misinterpretations by other students.

Teachers who had a teacher-centred notion of classroom life often failed to appreciate these social skills and behaviours. Instead, they expected the students to focus their attention primarily on them. They often censured such behaviour as it acted ‘against their planned curriculum’ (Malin, 1989, p. 254).

In contrast, middle-class non-Indigenous children came to school with expectations consonant with their middle class teacher’s ‘teacher-centred’ expectations. They, ‘expected that the teacher will monitor them closely, will
direct, persuade, reprimand and question them constantly. They have learned that in turn they will have to closely monitor the teacher, and that they will be expected to learn primarily from her’ (Malin, 1989, p. 252).

Malin described how cultural misunderstanding led some teachers to believe that Indigenous students did not appreciate them, and they in turn provided minimal educational support to some of the Indigenous students. In cross-cultural classrooms, these differences in social expectations led to reduced educational opportunity for the Indigenous students.

However, difficulties between non-Indigenous teachers and Indigenous students are not inevitable. When Harris and Malin (1994) explored the attitudes of a select group of teachers with a particular interest in working in Indigenous education they highlighted the distinctive relationship Indigenous students had with interested non-Indigenous teachers. Social interaction was more personal and less constrained by the formalities of the role of students. Teachers saw the Indigenous students as warm and friendly. Harris and Malin (1994) highlighted the importance of positive social relationships as a prerequisite for Indigenous students’ success at school. They suggested the following strategies described in Table 2.1.
Table 2.1  Relationship focussed educational strategies

<table>
<thead>
<tr>
<th>Strategies</th>
<th>Influence on relationships</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concentrate Indigenous students into groups within the class</td>
<td>Enables Indigenous students to interact with and be supported by Indigenous students rather than be isolated among mainly non-Indigenous students.</td>
</tr>
<tr>
<td>Family class groupings</td>
<td>Enables multi-age congregation similar to the home context. Fosters culturally derived skills in peer support.</td>
</tr>
<tr>
<td>Involvement by teachers with family and community</td>
<td>Supports the transfer of positive family influences into school life — students experience integration of social and school values.</td>
</tr>
<tr>
<td>Involvement of qualified Indigenous teachers</td>
<td>Supports interactions with Indigenous adults who are familiar with culturally-based values and communicative styles.</td>
</tr>
<tr>
<td>Lower teacher:pupil ratio</td>
<td>Enables more time for a personal relationship between teacher and student.</td>
</tr>
<tr>
<td>Greater parent involvement in schools</td>
<td>Fosters motivation of students in school though social obligations to family.</td>
</tr>
</tbody>
</table>

Harris and Malin (1994) suggested that positive social relationships are the building blocks for better educational outcomes for Indigenous students. More recent research also highlights the importance of positive social relationships and culturally responsive approaches, together with high expectations (Hudspith, 1996; McRae, 2000). Hudspith’s (1996) work in Darwin schools showed that exceptional non-Indigenous teachers can contribute to improved outcomes for Indigenous students. She offers an analysis of the factors that helped one of these teachers, Mrs Banks (not her real name) to be very successful with Indigenous students. In the analysis Hudspith described techniques that fostered good relationships with
Indigenous students because they aligned with the students culturally shaped social expectations.

Mrs Banks interacted with her students in a way that was different from the practices of the other teachers. The rhythm of her interaction with them was slower and calmer, and she had a gentler way of speaking to the students. There was less overt teacher control over the students’ movements in class, and she displayed respect for the Indigenous students’ sense of autonomy. This approach fostered peer learning strategies which allowed the students to work with peers they were comfortable with. However, her classroom was more than a haven of social comfort within the school. The students were allowed greater individual autonomy, but in a symbiotic relationship with her expectation that they would fulfil rigorous obligations to others, and this contributed to their engagement in the educational process.

By involving the families of the students in classroom activities and keeping the families informed, Mrs Banks fostered the students’ sense of social obligation. Mrs Banks also strove to bring aspects of her students’ home worlds into the classroom. She maintained links with their families (as recommended by Malin, (1989, p. 258) and Indigenous visitors were often welcomed into and afforded respect in the classroom. Mrs Banks’ respect for Indigenous sociolinguistic etiquette and the involvement of their families elicited a sense of social obligation on the part of the students, and they sought to meet her high academic expectations in their school work.

In their research, Partington et al. (1999) and Harslett (1998) identified key characteristics of relationship-based, student-centred pedagogy. These include an understanding of, empathy with, and sensitivity towards students. Also, with Indigenous students especially, it has been shown that it
is important for teachers to foster positive expectations. Teachers can build these elements into their work if they reject any tendency to think of their Indigenous students as having individual or culturally-based deficits, and if they recognise their individual and cultural strengths. The extent to which negative beliefs about Indigenous students can undermine educational outcomes is discussed elsewhere in this chapter.

Drawing on her work in Adelaide, Malin (1989) outlined the type of training and experience needed to develop such a culturally attuned and exceptionally successful non-Indigenous teacher. The teacher must learn to know the students, through observation, by listening carefully, and by thinking about what they see and hear. The teacher must also learn about the students by talking to their parents and relatives and others in the wider community, as well as by talking to Indigenous educators and by reading (Malin, 1989, p. 253). Most Indigenous teachers begin their work already equipped with the necessary cultural knowledge, insight and involvement.

Unfortunately, there is often little opportunity in the school day for teachers to contact people in the community. Furthermore, other teachers may see any out-of-class time spent with students’ families and other contacts during the school day as an evasion of ‘real teaching’ responsibilities, and they may exert pressure to keep teachers in their classrooms (ESL teacher in a personal communication, 1991). Mrs Banks’ classroom, as described by Hudspith (1996), is one that is rare and difficult to sustain. Her class was disbanded eventually, because of a lack of support for her approach from other teachers and senior staff. In this context it should be noted that schools have sometimes adopted an isolationist approach and tried to exclude Indigenous family contact (Nicholls, 1998). However, consultation with Indigenous
parents and their involvement in their children’s schooling, are characteristics of successful approaches to Indigenous education.

Partington et al. (1999) and Harslett (1998), in their studies of the successful teaching of Indigenous students, also focus on relationships and culture as important components in Indigenous education. They describe what they term a relationship-based pedagogy, with high expectations of students. It is an approach that includes respect for the cultural expectations of Indigenous students, such as autonomy, and the teachers develop relationships with the individual students and involve their families in the schooling to activate the students’ sense that the school has a place in their network of social obligation. Important elements of relationship-focused pedagogy depend on the teachers. They must become aware of the history and home background of their students, and appreciate their sense of autonomy and shame.

The central role of relationships in Indigenous educational outcomes is consistent with the importance of relationships in Indigenous life. Coombs, Brandl and Snowdon (1983) wrote: ‘Who a person is in an Aboriginal cultural context is a nexus of relationships, a set of bounded expectations, obligations and human connections’ (p. 257). The importance of relationships pervades all areas of Indigenous life, including education. It is a reality that educational practitioners and programs must address if successful educational outcomes are to be achieved with Indigenous students. This is highlighted in a report that evaluated what has worked in Indigenous education around Australia.

McRae (2000) described and evaluated eighty-three Commonwealth Government funded projects designed to quickly improve Indigenous children’s achievement at school. Their report gives an overview of the
practices and experiences of a wide variety of educators who have learned what works with Indigenous students. As with other research, this work highlights the importance of culture and relationships. It identifies a number of common key strategies that the educators realise are important in improving Indigenous children’s school performance in urban, rural and remote contexts. These strategies are described below.

*Cultural inclusion* - establishing high quality and significant cross-cultural relationships. Cultural factors were important in the decisions of parents to send their children to pre-school. Cultural acknowledgment and support were central in attempts to improve secondary school retention rates for Indigenous students (McRae, 2000, p. 39). Positive teacher attitudes towards Indigenous students were facilitated where teachers were aware of the cultural issues faced by Indigenous students (p. 66). Cultural inclusion seems to include many elements of cultural responsiveness.

*Flexibility* - doing things in different ways to achieve the same outcomes is important. This was particularly the case in urban environments where Indigenous students made up a minority of the school population.

*Localisation* - the importance of responsiveness to differing local contexts. The authors note that the majority of Indigenous people live in urban areas but that the educational contexts found in remote communities often dominate discussions about Indigenous education.

*Indigenous staff* – the involvement of strong and authoritative Indigenous staff who are accepted by their community is a crucial
contribution to positive outcomes for Indigenous students. A feature of successful projects was that they often had key figures, usually Indigenous, who acted as ‘translational figures’ and could operate effectively in both cultures, and interpret between them (p. 168).

Community of peers – group practices and activities allow Indigenous students to spend time together so they can build a community of peers that fosters individual student success at school.

Indigenous languages - recognition of, and respect for the varieties of non-Standard English spoken by Indigenous people and promotion of the learning of Indigenous languages is important.

Expression of culture - finally, schools should be pro-active in making reference to culture and creating opportunities for cultural expression within the school.

The success of programs that focus on relationships and culture was notable. Programs that took relationships into account included those where students spent time in Indigenous-only learning groups or were able to network extensively with other Indigenous students within the school. Positive interactions between Indigenous students and non-Indigenous teachers were facilitated by cultural sensitivity on the part of the teachers. Indigenous students were helped with the development of pro-social skills to improve school retention rates. Indigenous students could seek support from Indigenous adults in the school – an initiative which was found to improve achievement and reduce behaviour problems. However, programs of this type require institutional support.
In summary, the research indicates that educational outcomes for Indigenous students can be critically affected by the quality of the relationships between the students and their teachers and peers. It also provides evidence of successful interventions using teaching methods that take the importance of these relationships into account.

**Institutional responsiveness**

While the research points to programs that can work, the development and implementation of such programs remains problematical. As Partington et al. (1999) explained, there are powerful institutional pressures that inhibit the efforts of individual teachers to adapt classroom practices so they are more responsive to Indigenous student needs. The Quality Schools for Indigenous Students Project (Partington et al., 1999) identified several institutional obstacles to school responsiveness to the needs of Indigenous students, and the associated review of the literature found that schools and teachers can take the lead in causing problems with Indigenous education (Harrison, Partington, Godfrey, Harslett & Richer, 1999). The identified problems include:

- poor pedagogy;
- low expectations of Indigenous students and negative attitudes among teachers arising from stereotyping of Indigenous students as deficient and/or uninterested;
- stereotyping of Indigenous students as obstructive; and
- poor communication and relationships between school administrators and the people in students’ homes.

Partington et al. (1999) concluded that, without a more comprehensive approach by schools, individual teachers could not change things.
Institutional factors also contribute to inappropriate deployment of Indigenous staff in schools. Partington et al. (1999) found that the subordinate role expected of Indigenous staff engendered conservatism in educational practice, and the authors indicated that teachers need to learn to empower Indigenous staff. In addition, Indigenous teachers can suffer from an institutionalised form of disempowerment that is often clothed in ethnocentric assumptions of teacher professionalism. This can mean that Indigenous teachers become frustrated when they are prevented from teaching and interacting with Indigenous students in the way they wish.

In research conducted in 1990 (Howard, 1990), I described the non-verbal teaching strategies of an Indigenous assistant teacher who was very successful when working with Indigenous students with a hearing loss. She was criticised by the teachers for not using verbal teaching strategies. Tucker (1992) also described the pressures on Indigenous student teachers to adopt culturally uncomfortable ways of working as a teacher. Often Indigenous staff are recruited to schools, only to find that their expertise is ignored and that they are marginalised within the school (Buckskin & Hignett, 1994), or used to enforce student compliance with imposed expectations (Harslett, Harrison, Godfrey, Partington & Richer, 1998; Harris & Malin, 1994).

The experience of two Indigenous teachers interviewed during this study confirms these conclusions. One said that she was criticised for being too friendly with Indigenous students in the playground, because the students would then expect the other teachers to be as friendly. The other reported that she was criticised for establishing what she considered to be a comfortable setting for interviews with Indigenous parents. She was told that if she appeared too friendly the parents would not respect her (personal communication 1991).
Heslop (1998) explained that assimilationist assumptions often limit effective Indigenous adult participation in the management of schools. Where involvement in school administration depends on a degree of comfort with Western participation styles, Indigenous parents can be effectively excluded from exerting real influence (Ngarrityan-Kessaris, 1994). The way parents are excluded from the exercise of power in schools is the counterpart to the way unfamiliar and uncomfortable classroom participation styles can exclude Indigenous students from educational opportunity.

The strategies identified by researchers as effective in improving Indigenous children’s educational outcomes can not be implemented without institutional support. For example, the employment of Indigenous teachers, the establishment of Indigenous-only learning groups, and work to foster cultural awareness and expression all depend on institutional support, as do programs to cater for Indigenous children with hearing loss.

When considering school system responses to Indigenous hearing loss, I recommended the following strategies to deal with this particular problem (Howard, 1990).

- Develop and implement programs to identify students with current hearing loss.
- Consider the educational needs of students with hearing loss in the allocation of resources at systemic and school levels.
- Avoid streaming, which channels students with conductive hearing loss into lower ability groups and inhibits the use of compensatory peer learning strategies.

A recent review of services to Indigenous children with conductive hearing loss in South Australia points to the lack of an institutional response being a
major obstacle to more effective services for Indigenous children with conductive hearing loss (Snodgrass, 2006).

When considering Indigenous education in general, Partington et al. (1999) concluded that the lack of school support for teachers who were interested, committed and effective when working with Indigenous students was one contributor to the poor educational outcomes for Indigenous students. It could be said that a lack of institutional support for change can result in the construction of an institutional learning disability that in itself constitutes a serious obstacle to the provision of effective education to Indigenous students, especially those with conductive hearing loss. To understand the reluctance of schools and teachers to change what they do, a prior understanding of the explanatory frameworks that teachers use when working with Indigenous children is needed.

**Resistance, the universal child and individual deficits**

Examinations of the relevance of culture to aspects of Indigenous education have mainly involved consideration by non-Indigenous researchers of the ways in which Indigenous culture influences Indigenous children at school (Harris, 1980; Folds, 1987). There has been scant consideration of the ‘culture’ of non-Indigenous teachers, and especially their attitudes and responses to Indigenous children that can shape the educational outcomes for these students. The teachers’ attitudes and responses reflect the conceptual constructs that inform and shape the way they work with Indigenous students. When these constructs explain Indigenous student failure at school as a function of the student, they effectively exclude any recognition of the possibility that there may a need for institutional change. These constructs include the belief that Indigenous students resist or reject what school has to offer and/or have deficiencies that predispose them to failure, and they rely
on notions of equity to justify schooling that fails to meet the needs of Indigenous students.

School failure by Indigenous children has been described by some as an act of deliberate resistance to cultural oppression. Folds (1987) described student, staff and community resistance to schooling. Folds suggested that students resist schooling that is steeped in an alien culture by ignoring and ridiculing the teacher, as well as by disrupting classes or absenting themselves from school. Other reported acts of ‘resistance’ related to student preferences for a group focus for their work and students who chose to speak in languages other than English. Morris (1989) described one Indigenous group’s post-assimilation resistance to mainstream culture. He referred to a process of cultural adaptation in which collective activities such as drinking and gambling represent resistance to the individualism of the mainstream culture.

One difficulty with these ‘resistance’ hypotheses is that they come from non-Indigenous researchers, are often based on limited information, and use data that can be interpreted in a variety of ways. For example, a child may not use English at school for a variety of reasons, such as a lack of familiarity with that language because they have a degree of hearing loss. Moreover, Malcolm (1982) points out that often teachers confuse socio-linguistic differences with non-compliance - ‘resistance’ is just one possible explanation of some behaviours. However, the notion of student ‘resistance’ has some currency, in that teachers who give it credence can exclude Indigenous students from educational opportunity.

Malin (1989) mentioned one teacher who viewed Indigenous students’ culturally-based classroom behaviour as a rejection of her and her teaching.
Her response was to provide minimal educational support to these students. So, if a teacher perceives student resistance, this may shape the way they interact with Indigenous students. Predetermined and judgemental attitudes can contribute directly to student failure. In effect they become self-fulfilling prophecies when they cause teachers to behave in ways that limit their students’ access to the educational resources the students need if they are to succeed.

Another preconceived attitude that limits teachers’ ability to adapt to the needs of Indigenous students is one that involves the rejection of ideas about diversity among students. Erickson and Mohatt (1981) refer to the belief some teachers have about the ‘universal child’; a companion concept is that of ‘the universal teacher’. These notions imply that any formally qualified teacher should be able to meet the educational needs of any student. It is worth noting that this apparently worthwhile ideal assumes a homogeneity of children that fosters assimilation. A mono-cultural conceptualisation of childhood learning and social interaction means that diversity is ignored. However, this belief is often submerged in notions of equal treatment — ‘I treat all students the same’. What is not stated is that all are treated as if they were white middle-class students.

While the notion of equal treatment may be used to justify dismissal of student diversity as a pedagogical issue, it is also true that non-Indigenous teachers can become the victims of this idea. Formally qualified non-Indigenous teachers may feel they have failed professionally when Indigenous adults without formal qualifications are able to relate to, and communicate with their Indigenous students more effectively than they themselves can do. When control and responsibility in schools lie in the hands of formally qualified teachers, the teachers may expect that they
should be able to work as effectively, if not more so, with Indigenous students than ‘unqualified’ Indigenous adults. The resulting human, if regrettable, response is often for teachers to marginalise and ignore the Indigenous education workers (Harslett et al., 1998). When Indigenous education workers were asked what advice they would like to give non-Indigenous teachers they replied that, ‘teachers should not feel jealous of Indigenous education workers’ better relationship with Indigenous students’ (Personal communication, Kimberly Indigenous education workers, 1998).

The work of Malin (1989), Hudspith (1996), Lowell (1994) and Massie (1999) effectively discredits the companion concepts of the ‘universal teacher’ and the ‘universal child’. Malin’s work demonstrates that teachers who are not knowledgeable about, or interested in the culture of Indigenous students do not provide them with an adequate education. Conversely, Hudspith’s work demonstrates the capacity of knowledgeable and interested teachers to provide a superior education to Indigenous students. Lowell and Massie show that Indigenous teachers have the capacity to minimise problems associated with Indigenous students’ conductive hearing loss.

Another major belief set that is common among non-Indigenous teachers involves ‘deficit’ hypothesising about Indigenous students. Deficit hypothesising is immensely attractive to teachers as a way to explain Indigenous children’s school failure. Its attraction is that the failure can be attributed to the children, their families, their culture or even their ears. Although discredited, these beliefs are still extant and evident in the attitudes of some teachers (Nicklin Dent & Hatton, 1996).

When classroom practice is based on deficit logic, it leads to lower expectations, a compromised curriculum, and reduced academic demands on
the most academically needy students (Heslop, 1998). So, as with teacher perceptions about ‘resistance’, teachers who believe in ‘deficits’ may themselves be a cause of the poor educational outcomes they seek to explain.

Deficit thinking evolves. It can incorporate new knowledge into a framework of old attitudes that serve to resist change in schools. Thus, the idea of a genetic deficit was replaced by one of welfare disadvantage, which in turn was replaced by ideas of cultural difference to justify low expectations of Indigenous children. In this respect, the endemic hearing loss found among Indigenous children may be another attractive addition to the deficit explanations for failure. After all, it is a problem that affects individual children and that disproportionately affects Indigenous children. However, the work of Lowell (1994), Massie (1999) and Snodgrass (2006) suggest that the ‘deficit’ that needs to be considered is the lack of an institutional response to the educational needs of Indigenous students with conductive hearing loss.

To summarise, the reluctance of schools to change is reinforced by explanations for Indigenous student failure that justify inaction. Teacher perceptions of student ‘resistance’ may promote educational exclusion that promotes school failure. Assumptions based on theories about ‘universal’ teachers and students serve to justify the dismissal of diverse needs. Deficit theories still underpin the views of many teachers about the reasons for poor Indigenous student outcomes. In the final analysis, these ideas lead to a situation where indigenous students are held responsible when schools do not meet their educational needs. In effect, teachers beliefs about Indigenous student ‘resistance’ or ‘deficits’ may contribute to the school outcomes they are seeking to explain, and hearing loss is a very appealing excuse for school
failure. Indigenous children are not the only victims of such processes. Any student who is ‘different’ may become a ‘victim’.

**Teacher response to student ‘difference’**

There is a professional expectation that teachers will provide their services equally to all students. However, it has been shown that teachers systematically favour students who are from a similar background to themselves, and students who appear appreciative of what they do (Malin, 1989). Jackson and Lahaderne (1967) also reported that teachers saw students who appear satisfied with their schooling as more able and intelligent. The selective bestowal of favours by teachers is a longstanding practice. Indeed, it has been argued that teachers can only deal effectively with a limited number of students, these being the ones they are best able to understand because they come from a similar socio-economic background. Others are often labelled ‘thick’ or ‘difficult’.

The overt selection of favoured students amounts to a de facto selection of unfavoured students. The lesser number and inferior quality of the interactions that teachers tend to engage in with ‘different’ students are, in effect, also a de-facto selection of unfavoured students. Indigenous students, with their different cultural background, are among the students least likely to be favoured by non-Indigenous teachers. Among Indigenous students, those with conductive hearing loss are likely to be most different as they have the greatest difficulty in the highly verbal learning contexts of school (Howard, 1990).

Malin (1989, 1997) demonstrated that there are important educational consequences when some Indigenous students are ‘out of favour’ with their teachers. ‘The amount of reading time and the amount of educational
support the students received in general depended on the students’ popularity with the teacher, rather than on any educational principle’ (Malin, 1989 p. 604). When a student is out of favour with their teachers this affects the students’ confidence in, and respect for teachers. Partington et al. (1997) reported that while most Indigenous students were pro-school, a high proportion thought their teachers did not care about them, treated them unfairly, and did not understand or encourage them. Further, a high proportion of Indigenous students did not respect their teachers (Partington et al., 1997).

The way teachers respond to student difference is a particularly important issue when they are working with Indigenous students with hearing loss. When considering the educational disadvantage associated with hearing loss, it is important to consider how Indigenous children with conductive hearing loss may appear different from the other students at a school, and the way the teachers respond to this difference.
SECTION TWO
LITERATURE REVIEW

Chapter Three
Conductive hearing loss, social justice and Indigenous educational theory
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Conductive hearing loss, social justice and Indigenous educational theory

There are a number of social justice issues associated with Indigenous hearing loss. Students from disadvantaged backgrounds, and especially Indigenous students, experience more conductive hearing loss than other students. This means the inertia of the education systems, which have not acted to deal with the issues that confront students with mild to moderate conductive hearing loss, have a greater impact on Indigenous and other disadvantaged students. Conductive hearing loss may in part contribute to educational disadvantage that has been attributed to theoretical constructs, such as cultural differences and oppression. This chapter considers these ideas.

Social justice

Current service provision generally ignore the needs of the many children with mild to moderate conductive hearing loss and focus on the smaller number of children with severe to profound, mostly sensori-neural, hearing loss. The reasons for this are diverse. The disability of those with more severe levels of permanent hearing loss, the deaf, is obvious. In contrast, those who have a lesser degree of hearing loss often attempt to simply get by, by themselves, in a hearing world. Some may be unaware of their disability or may not wish to disclose it. It is common for adults with mild to moderate hearing loss not to disclose to others that they have a hearing problem, despite often significant communication problems (Stika, 2000). Fluctuating conductive hearing loss among children is often not identified unless there are school screening programs and even then, teachers may not be informed.
of the results. The vast majority of the children with hearing loss that teachers will encounter are those with a mild to moderate conductive hearing loss.

As an often invisible disability that most affects sections of the community with limited capacity for self-advocacy, conductive hearing loss is vulnerable to neglect as a policy priority. The invisibility of the problem makes it difficult to gain the attention of policy makers. One example of this is the phasing out of school screening services in some areas. In Queensland, for example, school screening services are being phased out at the same time as neonatal screening for hearing loss is being introduced. Early screening of newborn babies for severe to profound sensorineural hearing loss results in the early identification of a small number of children with these problems. Deaf advocacy groups and the parents of deaf children operate as a well-networked pressure group that has successfully promoted this important issue. Neo-natal hearing screening was introduced as a policy initiative in the Northern Territory in 2006, while the strategic plan for Indigenous education developed that same year made almost no mention of conductive hearing loss that affects up to 90 per cent of Indigenous students in many remote communities. (Couzos et al, 2001)

School hearing screening identifies a larger number of children mostly with a current mild to moderate conductive hearing loss. However, there are few advocacy groups for the many children, often from disadvantaged communities, who experience conductive hearing loss during their school years. This is not to argue against neo-natal hearing screening, but to point out that sector-driven policy making may result in decisions that overlook issues that are significant but of major concern for disadvantaged communities. Further, as will be discussed in Chapter Ten, hearing screening
is a highly strategic element in service provision for children with conductive hearing loss. Without screening few referrals for formal hearing tests take place, and teachers and parents remain mostly unaware of which children have a current hearing loss.

Whilst one-off screening is not adequate to monitor fluctuating conductive hearing loss during school years, it does help to identify children who face educational risk because of conductive hearing loss. In New Zealand unpublished research data from the New Zealand Council of Educational Research (NZCER, 2004) indicate that children who failed their school screening at age five, one year later at age six, performed significantly worse than their peers on measures of literacy, mathematics, and social skills (with peers and adults), communication, logical problem solving and individual responsibility (NZCER, 2004). As in Australia, certain population groups in New Zealand (Maori and Pacific Island children and children from low socio-economic backgrounds) are far more likely to have failed their hearing screening tests and to be at greater educational risk. Cutbacks in school hearing screenings will have a disproportionate effect on children from disadvantaged backgrounds who experience more middle ear disease.

In the absence of identification processes for conductive hearing loss, policies or programs for children with conductive hearing loss are rather pointless. However, this is often of little concern to educators given the accepted notion in educational policy, that mild to moderate conductive hearing loss has little educational significance. While it has been suggested that a hearing loss as low as 15bB has educational significance for Indigenous students (McPherson, 1995), many education departments treat anything less than a bilateral 50 dB hearing loss as being of minimal educational significance (NT
DEET, 2005). However, even mild levels of conductive hearing loss can contribute to significant communicative and educational disadvantage.

The earlier, longer lasting, more frequent middle ear disease experienced by many Indigenous children greatly increases their risk of adverse outcomes resulting from conductive hearing loss. The multiple other areas of disadvantage experienced by Indigenous people, and known to exacerbate adverse outcomes from conductive hearing loss, further increase this risk. Current policy settings on hearing loss disadvantage Indigenous children as well as many other children from low socio-economic backgrounds. Educational policy is inherently, if unintentionally, discriminatory when the level of educational support provided to Indigenous students with conductive hearing loss is based on research findings from other populations that experience less middle ear disease as well as fewer other disadvantages.

This same research base has also influenced the training of the specialist teachers who work with hearing impairment. Their training generally provides very little information on, or support strategies for the many children who experience inconsistent mild to moderate conductive hearing loss during their school years. This results in difficulties with the development of programs for children with conductive hearing loss. When programs have been developed, notably for Indigenous students, they have been health rather than education focused and have often promoted approaches modelled on services for the smaller number of children with sensori-neural hearing loss (amplification and individual support, and language focused teaching strategies). My experience has been that the scale of the problem and the different needs of Indigenous children with conductive hearing loss mean that programs based on a special education
model of service delivery have often had limited success. This is supported by a recent service review in South Australia (Snodgrass, 2006).

The manner in which educational special needs are identified also serves to disadvantage children with learning and behavioural issues related to conductive hearing loss. The use of out-of-class psycho-educational assessments systematically disadvantages Indigenous students with conductive hearing loss (Chapter Six has a full discussion of this). The focus on out-of-class assessments to determine ‘educational need’ means that the ‘needs’ of children with listening problems will be consistently underestimated and they will then be disadvantaged in the allocation of special educational resources.

To summarise, the origins of the educational discrimination experienced by Indigenous students with conductive hearing loss are multi-staged. The limited support available to help them is the end point of a chain of neglect that includes:

- classroom teachers with almost no training in the educational issues associated with Indigenous conductive hearing loss;
- a lack of access to Indigenous educators or tutors who can help Indigenous children with conductive hearing loss;
- failure to consider conductive hearing loss during the allocation of school resources;
- underestimation of the classroom needs of children with conductive hearing loss during special needs assessments;
- poor identification processes for conductive hearing loss, and in some areas deteriorating ones;
- a lack of readily available advisory support related to conductive hearing loss;
• advisory teachers who receive limited training in the educational issues associated with conductive hearing loss;
• educational policy on conductive hearing loss which is based on research that has limited relevance to Indigenous students in Australia; and
• the lack of research on which to base consideration of appropriate educational policy, and the practical educational issues associated with conductive hearing loss among Indigenous students.

This has meant that Indigenous educational theory has not paid attention to conductive hearing loss because few people know it is an issue.

**Indigenous educational theory and conductive hearing loss**

Indigenous educational theory has focused on explanations for poor Indigenous educational outcomes and on the search for ways to overcome this disadvantage. In general these theories have focused on perceived problems with the students or with the teachers, or on the basic inequalities in society that can affect the education of students from minority groups (Erickson, 1986). ‘Cultural difference’ has often been used to explain away the apparent educational disadvantage that faces Indigenous children, as a minority group, relative to others in mainstream schools. This explanation is based on an apparent mismatch between the cultural expectations that apply at home and the cultural expectations they meet at school.

Erickson (1986) concluded that when there was congruence between the social participation structures of home and school there were better educational outcomes for Indigenous students. In Australia, Harris (1980) investigated Aboriginal learning styles among Indigenous children in remote communities. He explained their educational disadvantage in terms of Aboriginal learning styles that made it difficult for the students to learn
when faced with Western teaching styles. Malin (1989) found that the cultural distinctiveness attributed to traditional communities was also evident in an urban indigenous community and commented on the way in which cultural incongruence between student and teacher could result in educational disadvantage. However, Nicholls et al. (1996) criticised Harris and Malin for ignoring the wider socio-political factors associated with educational disadvantage.

The multi-dimensional models of Indigenous education put forward as a result of this debate (Partington, 1997) encompass micro-social processes and macro-economic and political factors. Given the widespread nature of Indigenous middle ear disease, it is important that Indigenous listening problems (conductive hearing loss and auditory processing problems) may be an unacknowledged contributor to the educational disadvantage previously attributed to ‘cultural differences’ and socio-political concerns. The rest of this chapter discusses this proposition.

Harris (1980), whose work has been very influential in Indigenous education, pointed to a mismatch between the preferred learning styles of Indigenous students and the typical teaching styles used in mainstream schools. The learning styles were identified from a set of social responses observed among Indigenous people at Milingimbi in East Arnhemland, in the Northern Territory. Harris was working, during the 1970s, in a community where middle ear disease was an endemic problem. A study, undertaken at this time, which included the community where Harris worked, had indicated that the levels of ear disease in Milingimbi were very high (personal communication, 2004, from Amanda Leach, a researcher into health aspects of middle ear disease). It is reasonable to conclude, therefore, that the majority of children, and many of the other community members that Harris
observed while developing his ideas on Aboriginal learning styles, would have had current hearing loss and/or auditory processing problems as a result of persistent childhood middle ear disease.

If one considers the five learning preferences that Harris (1980) identified as ‘Aboriginal learning styles’, they describe the sort of strategies commonly used by people with listening difficulties.

1) **Observation and imitation** - learning by observation and imitation rather than from verbal instruction. Learning by observation is often preferred by children with listening difficulties because they have problems hearing spoken instructions (Singleton, Supella, Litchfield & Schley, 1998). Training for teachers of the deaf encourages the use of visual teaching strategies for just this reason.

2) **Trial and error** - learning by personal trial and error rather than from verbal instruction and demonstration. Learning by trial and error is a compensatory learning strategy often used by children with listening difficulties as it circumvents their problems with verbal instruction.

3) **Real life whole tasks** - learning in real life, rather than from practice in artificial settings. Closely related to this approach is one described as learning by 'wholes', rather than in sequenced parts, or learning through successive approximations to arrive at a desired result. Real life settings provide a rich context for observation and visual learning skills can be used to best effect in these situations. Learning in ‘wholes’, instead of piecemeal (sequenced parts) is also the approach preferred by those with listening problems because when they understand the whole task it is easier for them to self-correct mistakes that result from misheard information. When learning depends on
verbally presented sequenced parts, misunderstandings are harder to self-correct.

4) **Context specific learning** – learning the specific skills needed in a given situation, instead of from general principles. Context specific learning permits effective use of visual observation to compensate for the poor speech perception of those with hearing loss. A common problem for those with listening difficulties is transferring learning from one situation to another.

5) **Person oriented learning** – focusing more on people while learning, and less on information. Here, the focus is on people and relationships rather than on the information someone is seeking to pass on. People with listening difficulties find it easier to communicate with people when they have an established relationship with them. An established relationship means that there is:

- more effective use of face watching and reading of body language;
- better understanding of people’s interests and motivation, which helps to improve speech perception; and
- more opportunity for communication styles tailored to the person’s communicative needs.

Recent studies of the prevalence of middle ear disease in the Northern Territory communities where Steven Harris worked, indicate that 90 per cent of the children have current middle ear disease, or perforations in one or both ear drums, or the ear drum scarring that is indicative of persistent middle ear disease in the past (Couzos et al., 2001). Fewer than 10 per cent of the children in these communities have normal hearing.
Other research also supports the proposition that it is the Indigenous children with current conductive hearing loss who are most likely to demonstrate what Harris (1980) saw as culturally different learning styles. Howard (2004) found that the Indigenous students with hearing loss in two remote schools were the students who were least likely to participate in teacher centred classroom verbal interaction. Further, more recent research indicates that it is the Indigenous apprentices with listening problems who have the strongest preference for learning through observation, undertaking ‘hands-on’ tasks in real life contexts, and knowing the whole task that they have to complete (Howard, 2005). Those with the fewest listening problems were the most comfortable with learning through verbal instruction in classroom contexts.

Therefore, there is evidence that hearing loss contributes to the social responses that Harris (1980) attributed solely to culturally-based learning styles. While cultural differences are important, it is apparent that the Indigenous children who are the least biculturally adept are predominantly the ones affected by listening problems. These are the children who have the most difficulty with verbally based and unfamiliar Western teaching styles. Conversely, cultural congruence between home and school teaching styles helps these children to rely on familiar communication styles and teaching processes to fill in the gaps in their perception of speech. It is easier to accurately interpret what is said by a familiar person from the same cultural background talking about a known topic than what is said by an unfamiliar person from another culture speaking about an unknown topic (Howard, 2006). While this is true for everyone, familiarity becomes more critical when hearing loss or auditory processing problems restrict a person’s capacity to perceive what is said. The level of familiarity with the teacher, the ways that they communicate and the content of their communication become important
factors in the coping strategies used by people with listening difficulties to improve their speech perception.

For Indigenous children with hearing loss, communicative disadvantage is compounded by the degree of cultural difference between them and their non-Indigenous teachers. Cultural differences affect the educational opportunity available to Indigenous children with hearing loss more than they affect other Indigenous children. It is the former who have most difficulty coping with classroom discourse structures (Howard, 2004), not only because of their hearing loss but because the communication process and the content are culturally unfamiliar. Furthermore, a high turnover of non-Indigenous staff will compound their speech perception problems because they will not know their teachers well. In this way, cultural differences and listening difficulties interact to result in communicative and, eventually, educational disadvantage for many Indigenous students.

Importantly, Indigenous children’s conductive hearing loss is often an invisible disability because the focus on cultural differences can mask the effects of hearing loss. Cultural differences are used to explain behaviours and outcomes that are partly related to hearing loss. The ‘hegemony’ of cultural difference as a theory in Indigenous education (Partington, 1997) may have prevented people from noticing the presence of listening difficulties and their educational effects. This view was reinforced by the comment from a teacher when a group of her students, who found it difficult to learn from ‘teacher talk’, were found to have impaired hearing. She had thought that they had learning difficulties because they were ‘just more Aboriginal than other students’ (Howard, 1992). Her focus on ‘cultural difference’ as the reason for certain social behaviours ‘masked’ the presence and effect of hearing loss. Indigenous students with a history of middle ear
disease will appear more culturally different than class peers without this history. This is because they have had more difficulty in engaging in the cross-cultural communication needed to build cross-cultural understandings and expertise (Howard, 2006). This means that Indigenous students with listening problems not only have more difficulty hearing what is said, but also in understanding what is heard if it is culturally unfamiliar.

This analysis suggests that a key concept in any attempt to meet the educational needs of Indigenous children with conductive hearing loss is their ‘familiarity’ with the people involved, and the content and nature of communicative processes. Programs that take into account the importance of an Indigenous student’s familiarity with the people who teach them, and that help the student to be taught in ways that are familiar to them, may have the capacity to improve educational outcomes for the many Indigenous children who experience listening problems. Ideally, the teachers should be Indigenous people who understand the school community (Howard, 2004). Non-Indigenous teachers should work in ways that are as familiar as possible to their students and use culturally responsive pedagogy (Howard, 1994; Partington & Galloway, 2005). Culturally responsive pedagogy provides ‘learning bridges’ between the home culture and the school culture (Erickson, 1986). For students with listening difficulties this should result in improvements in speech perception because the students are working with known people who are using language in a familiar way and talking about familiar things.

An understanding of the interactive effects of cultural difference and listening problems is important as one of the dimensions of multi-dimensional Indigenous education theory. When the effect of conductive hearing loss on school learning is not fully understood, this restricts the
opportunities for dealing with children’s learning needs in an effective way. If their problems are to be addressed effectively, Indigenous students with hearing loss will need more than just culturally responsive educational practice. Schools will also have to make decisions about, and commit resources to, things like the use of amplification and improvements in classroom acoustics, as well as to the use of more visually oriented teaching styles.

**Socio-political considerations and Indigenous listening problems**

Nicholls et al. (1996) highlight the fact that cultural difference alone is not sufficient as a theoretical model of Indigenous educational disadvantage. The history of dispossession and mistreatment of Indigenous people in Australia, as well as the ongoing inequities on many levels, validate, on the basis of common sense, the importance of a socio-political dimension in the arguments about Indigenous disadvantage.

Scrimgeour’s (2001) work points to resistance by many mainstream Australians and their institutions to Indigenous educational reform. She refers to resurgent support for assimilatory policies and economically rationalist approaches that obstruct Indigenous involvement in the setting of educational objectives. A 'donor - recipient' relationship frames Indigenous people as recipients of mainstream community benevolence which serves to disempower Indigenous educational initiatives. So too does the widespread 'institutional racism' within mainstream educational institutions, in addition to the ‘disempowering’ attitudes and practices of educators and institutions.

Socio-political factors have been mentioned as reasons for the exclusion of individual Indigenous students from school (Stehbens, Anderson & Herbert,
1999). These factors included school demands, conflict with other (non-Indigenous) peers, and students who felt they were ‘victimised’. These authors expressed concern about institutional perspectives that locate the causes of a student’s suspension in the home and in the community, and thereby absolve the school from blame. If schools believe that they play no part in contributing to the problem, then they have no reason to examine the assimilatory and exclusive aspects of their own educational practices. In contrast, Indigenous people indicate that they view the various factors that come together and lead to the suspension of Indigenous students as often outside the sphere of control of Aboriginal people (Partington & Gray, 2003).

While there are clearly many components to the socio-political dimensions of Indigenous disadvantage, Indigenous listening problems may interact with some of these components in ways that are not recognised for example, in school exclusions. Aboriginal and Torres Strait Islander (ATSI) students comprise only three per cent of the total student New South Wales student population, but were the subject of 18 per cent of all suspensions in 1995 (Stehbens et al., 1999). These authors identified a complex interplay of power relationships based around social, economic, gender and racial issues that serve to disadvantage Indigenous students. The issue most commonly mentioned by the Indigenous students, as a catalyst in the process that led to their exclusion, was their frustration with their inability to understand what was happening in the classroom and difficulties in understanding teachers’ spoken instructions. Indigenous students with hearing loss are the students who are most likely to have difficulty with teachers’ verbal instructions and display apparent behaviour problems at school (Howard, 2004). It seems probable that conductive hearing loss has contributed significantly to difficulties that were the catalyst for many school exclusions.
Hearing loss may also contribute in other ways to what are currently seen as the socio-political dimensions of educational disadvantage. There is evidence for this in my recent work (Howard, 2006) which suggests that Indigenous listening problems influence participation and decision-making in Indigenous organisations. There was evidence that 50 per cent of Indigenous adults involved in governance of two Indigenous community controlled organisations had in remote areas have functional listening problems related to hearing loss and/or auditory processing problems. Those with listening problems were found to participate least in meetings, especially when the discussion is about topics presented by non-Indigenous people. The people with listening problems often misunderstood what was said, asked for things to be repeated, and were more often ‘off topic’ or silent during discussions than the other Indigenous people at the meetings.

Indigenous adults with listening problems said that they were often reluctant to speak out because of their concern about being shamed if they had misunderstood what had been said (Howard, 2006). This suggests that responses that may be viewed as ‘submission to oppression’ may in part be the result of communicative uncertainties related to listening difficulties. Significantly, Indigenous apprentices with listening problems also mention a reticence about speaking in front of others when they were at school (Howard, 2005).

When Indigenous people remain silent or misunderstand what is said they are often deemed, by non-Indigenous people, to have limited motivation or capacity (Howard, 2006). This prompts their non-Indigenous colleagues to behave in exclusive or dominant ways ‘to get things done’. So, when they are not aware of the communicative effects of listening problems, non-Indigenous people may simply decide to attribute communication difficulties
to a lack of motivation or capacity. However, evidence is emerging that shows that people with listening problems participate more at work when communication is managed in ways that help them to understand what is going on; for example, by limiting background noise and using more visual cues (Howard, 2006).

It seems likely that Indigenous listening problems are a factor that can foster the development of unequal power relations. There are of course many more factors at work that can lead to socio-political ‘oppression’, but it is probable that listening problems are one, mostly unrecognised, contributory factor.

More research is needed to more fully investigate this issue. However, the incorporation of hearing loss as a theoretical dimension in any consideration of the issues associated with educational disadvantage may produce theory that better reflect the underlying educational realities as well as help to provide more effective strategies to address Indigenous educational disadvantage. Strategies such as amplification and training in communication strategies may be as important as ‘anti-racism’ and cultural awareness training in dealing with Indigenous educational disadvantage.
SECTION TWO

LITERATURE REVIEW

Chapter Four

Hearing loss and social interaction
Chapter Four

Hearing Loss and Social Interaction

The effect of conductive hearing loss on social interaction has not been well researched, even though social and emotional development, as well as school learning, relies on social interaction. This chapter describes some of the existing research on conductive hearing loss and the effect this can have on social interaction and apparent behaviour problems among non-Indigenous children. The few studies that have focused on Indigenous students in Australia are described in Chapter Six. Firstly, the chapter describes the research in the general area of language, as verbal interaction is one component of social interaction. Secondly, it describes the research in the field of social interaction, or rather, into what are seen as behaviour problems. Researchers have generally focused on these problems, and specifically on social responses that are unacceptable to parents or teachers, rather than on the whole range of responses displayed by children with hearing loss and the way others react to these.

Educational and social research on conductive hearing loss has mostly considered the existence of a causal link between early childhood conductive hearing loss and later linguistic, cognitive, educational or behavioural outcomes. The interest in these sequelae of conductive hearing loss has been to find an answer to the question: Should medicine take a greater interest in, and treat more aggressively, something which has been generally regarded as a minor medical condition, i.e. *otitis media*? As a result, much of the research into non-Indigenous conductive hearing loss has been overwhelmingly quantitative in nature and preoccupied with methodologies that could effectively establish causation. Social interaction or behaviour
problems have generally been considered as the consequential, additional, though minor, sequelae of past hearing loss. For social researchers, the effect of hearing loss on linguistic development has been one of the main interests. These approaches to the research have been shaped, in part, by the course of middle ear disease in Western populations, in which it is primarily a disease of early childhood.

**Early hearing loss and later language development**

Verbal interaction is one very important component of social interaction. The linguistic focus of the research into the effects of hearing loss reflects the common sense assumption that early hearing loss is likely to impact mainly on children’s language development. It is assumed that the effect of a distorted auditory signal on language acquisition will be the medium by which hearing loss creates disadvantage. The research results have been generally supportive of this proposition.

Thielke and Shriberg (1990), in a review of the relationship between Otitis Media with Effusion (OME) and speech and language, found that a total of 17 studies showed no relationship, whereas 21 studies yielded at least one statistically significant relationship between OME and deficits in one or more speech variables. They also reported a study which found a relationship between OME and an increased incidence of speech disorder among a group of native American Indian children, but no relationship between OME and an increased incidence of speech disorder among a group of non-Indigenous middle-class American children. They suggest that diverse social and environmental factors, and not just the course of the disease itself, may increase the risk of speech disorder in some children and mitigate risk in others. Therefore, the social and environmental factors associated with OME, rather than solely its aetiology, might be considered as critical factors with
reference to the exacerbation or mitigation of the damage OME does to those whose experience includes persistent conductive hearing loss.

Investigations into the relationship between OME and language acquisition have highlighted the importance of social interaction processes. Roberts, Burchinal and Clarke-Klein (1995) suggested that hearing loss may cause a child to be less responsive during social interactions, and to initiate them less often. A caregiver, in turn, may not receive the cues needed to establish the optimal responsive and facilitative social interaction style that has been shown to be linked to later language learning (Hoff-Ginsberg, 1990; Vibbert & Bornstein, 1989). Parenting style, that is, parental stimulation and direction of children, may also interact with OME, resulting in negative effects on later language skills. Parents of children with OME have been found to use language more frequently for regulatory purposes, and less frequently for information giving and questioning (Wallace, Gravel, Schwartz & Ruben, 1996).

Childcare quality, determined by measures such as caregiver:child ratios, has been found to interact with OME to affect attention but not language skills (Feagans, Kipp & Blood, 1994). Children with OME are less attentive in larger groups. On the other hand, the size of a group does not appear to influence the language skills of children with OME. Lower quality caregiving environments, typified by factors such as less frequent interactions and less ‘scaffolding’, to provide the support structures that help children learn to communicate, are also associated with lower scores on language and cognitive outcomes (Rach, Zielhuis & van de Broek, 1988; Phillips, McCartney & Scarr, 1987). These findings are relevant for schools when they are considering their teacher-pupil ratio, as this obviously affects the quality and quantity of social interaction in the classroom.
The quantitative studies that have explored this subject have failed to unravel the complexities of the interactions between the different factors involved. The trend of the research has been towards larger quantitative studies, in the hope that the resulting statistical control would help with the control of extraneous variables. It may be, however, that the models that explain the relationships between the variables and guide research are themselves in need of review. In this respect, qualitative studies that explore the relationships between the variables have the potential to provide greater clarity. Nevertheless, the findings on the association between hearing loss and language do suggest that it is important to explore the relationship between hearing loss, social interaction, and the environments in which that social interaction takes place.

**Hearing loss and social interaction**

As has been noted already, when researchers have considered social interaction they have focused on children’s behaviour problems. This focus has served to constrain consideration of the full range of social interactions that take place in relation to the social responses of children that are unacceptable to teachers or parents. As a result, the research reflects parent and teacher-centric perspectives and concerns.

**Early hearing loss and later behaviour problems**

As with language, most overseas studies that consider the relationship between hearing loss and behaviour have explored the associations between hearing loss in early childhood and the later behaviour of affected children. They incorporate a research bias that reflects the course of the disease in Western populations, where it is largely an early childhood condition that is usually resolved by the time children are at school. The results of this research have varied. Some researchers have failed to find any association
between past hearing loss and subsequent behavioural problems. Some have identified a limited association between the two. Others have found clear, though complex, associations between the two, and that the associations are affected by interacting mediating variables.

Black and Sonnenschein (1993) compared 21 children who had had at least two documented episodes of otitis media of unspecified type in the first year of life, with ten children who had had one or no such episodes. Differences between the two groups in the incidence of otitis media continued after the age of one. Mothers’ ratings of the children at five to six years of age, however, identified no significant relationship between earlier OME and later behavioural problems. In a follow-up study of 56 mostly Afro-American children, Arcia and Roberts (1993) found no significant correlations between the children’s cumulative periods of OME in their first three years of life and psychologists’ ratings of the children’s attention-related behaviour at ages two, three and four years.

Roberts et al. (1995) found no association between parents’ ratings of the children’s behaviour at twelve years of age and the total number and mean duration of episodes of OME in the children’s first three years of life. Paradise et al. (1999), in a large scale study, examined the relationship between parental stress, child behaviour at age one, two and three years, and earlier OME among 2,278 children, using parent checklists. Overall, they found no substantial relationships between either the parents’ ratings of parent:child stress when the children reached ages one, two and three years, or between the children’s behaviour problems at ages two and three years, and the cumulative duration of the children’s Middle Ear Effusion (MEE) during antecedent periods.
However, Paradise et al. (1999) did find associations between children’s behaviour and earlier MEE in a group of children from socio-economically disadvantaged backgrounds, and with parents who had a high level of background stress. This suggests that unidentified mitigating risk factors may have cancelled out the statistical effects. The associations Paradise et al. (1999) found between behaviour problems and MEE among low socio-economic groups suggest, as has work on language acquisition, that other elements of existing disadvantage, such as low socio-economic status or stressed parents, may combine with the hearing loss caused by MEE to exert an effect on children’s later behaviour. Setting aside the complexities of these putative interactions, these results strongly suggest that hearing loss can be most profitably considered not as an isolated factor, but as part of the whole life experience of a child. In particular, children’s conductive hearing loss needs to be considered within the context of the relationships that form the basis of the child’s social interaction.

Other studies have found even clearer associations between behaviour problems and past hearing loss. The Dunedin Study (McGee, Silva, & Stewart, 1982) was of 1,037 age cohort members. It was found that at age five years, all 69 of the children who had had either bilateral type B (abnormal) tympanograms or ventilation tubes (grommets) put in place in early childhood had significantly more teacher-reported behaviour problems than those with normal hearing. It was also found that, by ages eleven and thirteen, lower verbal IQ and parent and teacher reports of inattentive behaviour were significantly associated with an early history of OME. Forgays, Hasazi and Wasserman (1992) compared two groups of white, mainly middle-class, children from a university-affiliated private practice. The first group was made up of 25 children who had had six or more episodes of acute otitis media in the first two years of life. The second was
made up of 27 children who had had no more than one episode of acute otitis media. Maternal attitudes and perceptions were assessed during two surveys, the first when the children in both groups were two years of age, and the second, six months later.

The mothers of the group who experienced more middle ear disease rated their children as significantly more demanding and stressful, and themselves as more depressed and less competent, than the mothers of the second group. These results suggest that children’s hearing loss can impact on a mothers’ sense of parental competence and emotional well being. Silva, Kirkland, Simpson, Stewart and Williams (1982), studying non-Indigenous students with a history of conductive hearing loss, identified what they described as maladaptive behaviours. Children with current hearing loss displayed maladaptive fearfulness, dependency, restlessness, were more quarrelsome and were unpopular with other students. Interestingly, parents reported behaviour problems at age five, but not at age eleven. However, teachers did report behaviour problems at school at ages five and eleven. Why behaviour problems were more evident at school was not known. One study (Jerger, Jerger, Alford & Abrams, 1983) found differences between children with a history of otitis media on the Vineland Social Maturity Scale, a measure that uses parent and teacher reports of mature social behaviour. Those with higher incidence of otitis media had a lower level of social maturity. McGee et al.’s (1982) work suggests that there are gender differences in the behavioural responses; they found that boys, but not girls, with a history of otitis media exhibited more hyperactivity.

The most recent and currently definitive research on past hearing loss and the future behaviour of affected children was carried out by Bennett and Haggard (1999). In a creative approach using archival material, they
analysed results collected from all the children, some 12,000 individuals, born in Britain between April 5 and 11, 1970. Behaviour was assessed through questions in a general survey of parents at the age of five, and a survey of parents and teachers at age ten.

The measures of hearing loss, as the authors note, are crude. They were based on parent reports of suspected hearing problems or ear discharge. Given that otitis media is often asymptomatic, it could be expected that the level of hearing loss would be far greater than that identified by parents. Further, the fact that parents were aware of the hearing loss may have minimised the possibility of adverse social outcomes because once parents are aware that their children have hearing loss, they tend to adjust their communicative behaviours to compensate. Thus, when parents realise a child has a hearing loss they may act in ways that guard against communicative dysfunction and related behaviour problems. Accordingly, parents who are not aware that their child has hearing problems may report more behavioural problems than parents who know about a hearing problem, for which they are already compensating. Despite this limitation, however, this study supports the view that hearing loss is associated with behavioural problems.

Factor analysis by Bennett and Haggard (1999) yielded two types of behaviour associated with parental reports of suspected past hearing loss at age five. These were ‘antisocial’ and ‘neurotic’ behaviours. Antisocial behaviour was subdivided into two second-order factors: (1) hyperactive behaviour, the child was not concentrating, was teasing other children, and was excitable, impulsive, restless, overactive, and easily distracted; and (2) behaviour associated with ‘poor conduct’, characterised as destroying belongings, frequent fighting, and taking things belonging to others.
Bennett and Haggard (1999) also found associations between maternal malaise, hyperactivity and hearing loss. The authors suggest that this indicates that there is a synergy between hearing difficulty and maternal malaise to the extent that both affect hyperactivity. That is, for some children the combination of early hearing loss and maternal malaise means that they are more likely to display hyperactive behaviour at a later date. This is consistent with Paradise et al.’s (1999) finding that parents with higher background stress levels were more likely to be stressed by children who had hearing loss. This points to the importance of parental factors which affect the influence hearing loss has on children’s behaviour, and the need to provide support for some parents of children with current hearing loss, or a history of hearing loss.

As stated earlier, Haggard and Hughes (1991), in reviewing the literature on the sequelae of OME, identified fifteen factors that may act synergistically with hearing loss to create adverse outcomes for children. Many of these factors may impinge on the quality or quantity of social interaction experienced by the child. Factors included the communication style of parents, the social and economic stability of the family, the noise level at home and the number and age of siblings. At school, pertinent factors included the general quality of education, the size of classes and parental involvement in schooling.

The research highlights factors that impinge on the nature of a child’s relationship with parents and can mediate the degree of disadvantage associated with conductive hearing loss. Disadvantage associated with hearing loss is more likely when parents experience higher levels of stress (Paradise et al., 1999) or come from a lower socio-economic background (Thielke & Shriberg, 1990) where high demands on parental time, due to
financial difficulties, poor health, or formal or informal work loads, may impinge on parental availability for social interaction.

It may also be that the difficulties which parents experience when interacting with children with hearing loss serve to reduce the quality and quantity of parental interventions. One study found that the mothers of children with a history of OME were less warm and sociable with their children (Black et al., 1988). Forgays et al. (1992) found that the parents of hearing-impaired children view themselves as less competent than other parents, and also experience more depression. This indicates that a child’s hearing loss has an effect on parents that rebounds on the child. Parents who feel less competent or are depressed are likely to interact less or less well with their children. If so, this may precipitate a cycle of diminishing quantity and quality of social interaction and increasing social problems for both child and family. The impact of conductive hearing loss on the whole family is an important issue for future research.

In a personal communication in 1999, Dorothy Moore, a speech pathologist and audiologist reported, from her clinical experience, that many parents of hearing impaired children said that they did not like their child. Once the problem with the child’s hearing was identified, and parents understood the reason for their child’s unresponsive or non-compliant behaviours, this helped to relieve feelings of guilt about their emotional attitude, or lack of one, towards their child. While there is no literature on the topic, siblings and friends are also likely to be affected by the social responses of children with hearing loss. It may be that there is a cycle of increasing disadvantage at school mediated by deteriorating relationships between children with hearing loss and their teachers and peers. If so, problems in teacher/child
relations can be eased by identifying the children with hearing loss and a better understanding its social consequences.

In summary, these studies suggest that behaviour problems associated with a history of hearing loss are related to complex and poorly understood interactions between hearing loss and other variables. These include factors that shape the quality of the relationship children have with their parents, such as parent coping skills and stress levels, socio-economic background and the number of siblings and their ages. At school there appear to be aspects of the school environment, such as class size, that may interact with past hearing loss to contribute to behaviour problems in school settings. Other factors, as yet unrecognised, may also impact on the relationships that children with hearing loss have with their teachers and peers.

Current hearing loss and behaviour problems
The few studies that have considered current hearing loss and current behaviour in the non-Indigenous community have found a clear relationship between the two. Van Cauwenberge, Van Cauwenberge and Kluyskens (1985) categorised 1,512 Belgian preschool and kindergarten children aged two to six years according to their tympanometric status. The children categorised as having otitis media were rated by their teachers as having poorer attentional abilities and social behaviour than those categorised as not having MEE.

Vernon-Feagans, Manlove and Volling (1996) observed 36 middle-class children aged between 18 months and 49 months in a day care setting. Those who had had otitis media at least 20 per cent of the time played more often alone and had fewer positive or negative verbal interactions with their peers than children who had had otitis media less than 20 per cent of the time. This
is the only study reported in the literature that draws on direct observation of the social interaction of children with a current hearing loss, rather than relying on the reports of parents or teachers.

An internet published report (MacDonald, 2000), conducted by a parent self-help group, provides some of the most detailed descriptions of hearing loss and social interaction at different ages. A survey of parents of children with a cleft palate, who are more prone to otitis media, detailed social responses associated with a current hearing loss that varied with age. Parents of preschoolers (ages four to six) indicated marked changes in behaviour when the child had a current hearing loss. Of the 70 per cent of parents who reported some change in the social behaviour of children with hearing loss between the ages of four to six, most reported difficulties with discipline (76.9 per cent), and that the child was argumentative and easily frustrated (55 per cent), and was passive with peers (15 per cent). Negative behaviour exhibited by peers toward the child with hearing loss was reported by 52.6 per cent of parents. The majority of parents (60.8 per cent) also reported changes in school behaviour. This involved noisy, boisterous, clowning behaviour (30 per cent). One parent commented that her child tried to become the centre of attention, to try and control situations. An equal number of parents (30 per cent) saw an increase in withdrawn, quiet behaviour.

Parents also reported age differences in the children’s responses. The infant, toddler, and pre-school children tended to display aggressive, demanding behaviour, while the seven-to-ten-year olds seemed equally apt to become quiet, sulky and withdrawn during periods of hearing impairment. Parents in MacDonald (2000) also reported that adolescents with hearing loss tend to feel inferior, hurt, defeated, and to resent correction. Rather than demonstrating the clowning and attention-attracting behaviour of the
younger children, they attempted to distract attention from themselves. For example, they would give any answer to a question to turn the focus of attention in other directions, or appear involved elsewhere, or talk most of the time to avoid having to worry about listening. These results suggest that the social difficulties of children with hearing loss vary with the child’s developmental stage.

Some of the most interesting but little-recognised work in the area of current hearing loss and behaviour was carried out in Australia by Moore and Best (1980). In their study of 537 children they asked teachers to identify ‘problem’ children. Twenty six per cent (140 children) were identified as having behaviour problems. Of these, 116 were identified as having serious behaviour problems. Hearing assessments were carried out on the same day that teachers filled out the behaviour surveys. Sixty per cent of the children identified with behaviour problems were found to have a current hearing loss and a further 30 per cent had the abnormal middle ear function that is indicative of probable past hearing loss. Overall, 90 per cent of students identified by teachers as having behaviour problems had a current hearing loss or abnormal middle ear function; a quite remarkable finding. The questions most often responded to in the questionnaire completed by the teachers tended to relate to anti-social, neurotic or hyperactive behaviours.

Teachers described children with hearing loss as ‘worried and worrying about many things’. The authors postulated that the unpredictable events during the school day increase anxiety, but they noted parents did not report anxiety at home. They concluded that the more familiar home environment might lessen problems with anxiety. These results are mostly consistent with the general factors associated with ‘antisocial, neurotic and hyperactive behaviours’, as described by Bennett and Haggard (1999).
At home parents reported disobedience, continual crying, restlessness, loneliness and low self-esteem. When parents were asked how they felt about their child, 53 per cent reported feeling angry, 16 per cent annoyed, 13 per cent impatient and 10 per cent felt concerned. Only eight per cent reported feeling happy with their child. Moore and Best (1988) concluded that parent/child relations may be damaged by hearing loss and otitis media. This is consistent with Forgays et al.’s (1992) findings about parent responses to children with hearing loss. Both these results point to the potential damage conductive hearing loss can cause to parent-child relations and the need to provide support to minimise these. Moore and Best (1980) also reported children who were having difficulties with modulation of the loudness of their own voices, particularly during meal times. Talking, chewing and swallowing may ‘drown out’ the voice of the person who is speaking. This means that meal times at home and at school are likely to be socially difficult for children with a current hearing loss.

Despite these quite dramatic findings (90 per cent of students identified with behaviour problems had current hearing loss or the middle ear problems indicative of past and/or future hearing loss) there has been little follow-up work in this important area.

While few in number, these studies suggest that current hearing loss can have a substantial impact on social interaction. They describe responses similar to the antisocial and neurotic behaviours reported in studies examining early hearing loss and later behaviour. Research findings that suggest that behaviour problems arise more often at school raise a question about whether there are aspects of the school environment that contribute to increased behaviour problems.
School environment and behaviour problems

A number of studies have indicated that, according to teacher and parent reports, children with a history of hearing loss or a current hearing loss display more behaviour problems at school than at home (Silva et al., 1986; Moore & Best, 1980; Bennett & Haggard, 1999). It is not known whether this is an artefact of the different observational interests and/or opportunities available to teachers and parents, or whether there are aspects of the school environment that encourage children to display behaviour problems to a greater degree at school.

Bennett and Haggard (1999) reported that at age ten, the parent and the teacher reports of children’s behaviour showed some interesting differences. While parents reported neurotic, clumsy, and hyperactive behaviour among children with earlier hearing loss, the association with hyperactive behaviour being particularly strong, they did not report anti-social behaviour. In contrast, teachers reported that early hearing loss and ear discharge were significantly associated with anti-social behaviour, but only marginally associated with clumsy behaviour. These differences in the results, between teacher and parent perceptions of behaviour, may reflect either the different relationships, concerns, and observational opportunities of parents and teachers, or the children’s different behaviour in different environments, or both.

Teachers routinely observe the social interaction of children at school in an environment that includes more children than there are at home. In addition, the challenge of maintaining discipline means that teachers control the social participation structures in school to a greater extent than is usually the case outside school. This means that non-compliant behaviour becomes a more significant issue for teachers than it is for parents, and is more readily
observed by the teachers. So, while antisocial or non-compliant behaviours are more likely to be noticed by teachers, neurotic behaviours such as anxiety and social withdrawal are less likely to be noticed by teachers among the 20 to 30 students in their care. This may be because they offer less of a challenge to teacher control and are only noticed when children are closely observed. Parents, on the other hand, have more of the sort of personal interaction that offers insight into a child’s thinking processes and emotional states, so they are more likely than teachers to be aware a child’s cognitive and affective responses, such as anxiety.

Moore and Best (1980) suggest an interesting practical outcome from the differing perceptions that parents and teachers have on behaviour problems. They noted that more than half the children identified with a hearing loss in their study did not return to the same school the following year. They put forward an explanation for this; that the parents may blame the school for problems not evident to them at home, and change the school.

These results raise an important question of interest for this study: Are there aspects of the school environment that may contribute to more evident anti-social responses? These might include the restriction of opportunities for social interaction and the high levels of background noise at school.

Summary

Past research has been preoccupied with answers to questions pertinent to the health of children and investigations into the extent to which early hearing loss affects children’s future language, educational or cognitive outcomes. The increasingly large and complex quantitative studies suggest that diverse social and environmental factors can increase or mitigate the risk of adverse consequences as a result of early conductive hearing loss. There is
a need for more research to explore these ideas. This can be done through small-scale qualitative studies (Bennett & Haggard, 1999).

One important variable to consider when seeking to understand the disadvantage associated with conductive hearing loss is social interaction. Of particular interest is the social interaction between a child and its parents, siblings and friends, as well as with its teachers and peers at school. It is through social interaction that linguistic, cognitive and general social development takes place. Studies have found that conductive hearing loss is associated with a diminished quantity (Vernon-Feagans et al., 1996) as well as quality of social interaction (Silva et al., 1982; Jerger et al., 1983). Evidence suggests that a child with hearing loss may instigate interactions less often and be less responsive to others (Roberts et al., 1995), with the result that there is a diminished quantity and quality of social interaction between the child and caregivers (Hoff-Ginsberg, 1990; Vibbert & Bornstein, 1989).

Linguistic and cognitive development is influenced by the quality and quantity of social interaction outside the home as mediated, for example, by child:caregiver ratios (the number of children per caregiver) which have an impact on children with hearing loss (Rach et al., 1988; Phillips et al., 1987). Differing patterns of social interaction have also been found with reference to gender (McGee et al., 1982) and developmental stage (MacDonald, 2000). Parenting styles may also interact with hearing loss to affect social and linguistic development (Wallace et al., 1996).

Most studies consider the results of antecedent hearing loss. Some, however, have investigated the impact of current hearing loss. In Australia Moore and Best (1980) conducted the previously mentioned major study of current conductive hearing loss and behaviour. They found 90 per cent of children in early childhood classes who had behaviour problems were identified as
having a current hearing loss or abnormal middle ear function. The responses they described are consistent with the anti-social and neurotic clusters of behaviour described by Bennett and Haggard (1999).

In terms of future research, the past research raises many interesting questions. One is the difference in the reported incidence of behaviour problems at school and at home. Parents observe more neurotic, clumsy and hyperactive behaviours at home, while teachers observe more anti-social behaviour at school (Moore & Best, 1988; Silva et al., 1986; Bennett & Haggard, 1999). These differences may relate to differences in the nature of a child’s relationships with its parents and teachers and/or differences in the observational opportunities available to the adults in these roles. However, they may also exist because the child behaves in different ways in different situations. If so, an important question must be answered: Why do children with hearing loss demonstrate more anti-social behaviour at school?
SECTION TWO

LITERATURE REVIEW

Chapter Five

Background noise in schools
Chapter Five

Background Noise in Schools

As described in the previous chapter, some research has found that teachers of children with conductive hearing loss report behaviour problems at school, while parents did not report similar problems at home. One explanation for this is that there are aspects of the school environment that interact with hearing loss to generate behaviour problems at school. The level of noise in the school environment is a possible culprit. Schools are often noisy places, partially because large numbers of children are gathered together. The simultaneous chatter of the children produces a high level of background noise in many school settings. Teachers must manage student-generated noise levels to instruct the children verbally. Noise levels vary. They can be relatively low during instruction and work time. They can be very high when children are given permission to talk with their peers. Classroom background noise and other noise-related factors that influence speech perception at school fall into the domain of school acoustics. This subject is the focus of this chapter.

School acoustics

School acoustics is a science that is concerned with how the transmission and reception of sound in school environments enables or obstructs verbal interaction. Sound is measured in decibels (dB), and the quality of the verbal communication available to a listener is measured by the signal-to-noise ratio. This describes the difference between the level of the sound someone is listening to (the signal) and the level of the background noise (noise). The greater the difference between the signal and the background noise, the
easier the signal is to ‘hear’. A signal-to-noise ratio of at least 15 dB is recommended for classrooms. That is, the acoustic signal is 15 dB greater than the background noise. However, this ideal is rarely achieved (Crandell, Smaldino & Flexer, 1995).

The average level of a teacher’s voice in the classroom is 65 to 70 dB. In a typical classroom, background noise levels range between 55 to 75 dB, although certain places are much noisier, such as computer rooms (73 to 79 dB), cafeterias (75 to 80 dB), and gymnasiums (80 to 85 dB) (Edwards, 1997). Noise levels in playgrounds are generally not considered as an issue in school acoustics, and were not mentioned by Edwards. In Australia, studies carried out by the then National Acoustic Laboratories (Williams & Sinclair, 1991) found that classroom noise levels in remote schools in the Northern Territory ranged from 58.1 dB to 81.2 dB. Ceiling fans were a major contributing factor to background noise levels in the tropical climate. Sound level recordings made in playgrounds in this study were in the 75 to 85 dB range.

A number of features contribute to the level of background noise in classrooms. Firstly, there is the amount of noise generated by the talk of children and teacher. This is most commonly the major influence on background noise. Secondly, there is the sound generated by the equipment in the room and noise intrusion from outside the room. Thirdly, there are the acoustic properties of the classroom. In the literature on school acoustics, there is little work on the influence of class sizes or the ways in which teachers’ organisation of their own and students’ classroom talk contributes to signal-to-noise ratios. The major contributor to background noise in classrooms, however, is child and teacher talk. Also, background noise in the form of talking may have more impact than the other sources of background
noise. Background chatter has been found to more disrupt performance (Jones, 1989), and children’s talk has been found to mask speech perception more than any other sources of noise (Crandell et al., 1995). There is also evidence that noisy home environments can affect performance at school.

Cohen and Weinstein (1981) discuss research which shows that auditory discrimination and reading achievement can be adversely affected when children live in noisy situations, even though their schools may be no noisier than average. However, while there is much evidence that attests to the adverse effects of background noise caused by talking, there is little information on ways of managing the social organisation processes in the classroom to minimise these effects. Many studies demonstrate the adverse effects of intrusive noise. Adult students experienced greater fatigue when listening with background noise created by fans, while external airplane noise has been found to have an adverse effect on concentration (Koszarny, 1978) and reading (Green, Pastenak & Shore, 1982). One study found that reading scores in classrooms subject to intrusive noise were lower than those in classrooms without background noise intrusion (Lubman, 1997).

The science of school acoustics has concerned itself with noise intrusion and the acoustic properties of classrooms. Typically, school acoustic studies have been concerned with how to improve signal-to-noise ratios by manipulating physical rather than social factors, for example, reducing noise intrusion by improving the design of ventilation and air-conditioning systems. Also, in terms of their acoustic properties, classroom noise levels are influenced by the reverberation properties of the room. With greater reverberation, there is a greater build-up of noise, which then propagates more uniformly throughout the room. Measures to reduce reverberation include adding
acoustical insulation to partitions, double-glazing windows, and padding interior walls and surfaces with absorptive materials.

Amplification of desirable signals can compensate for the reduced auditory input that results from conductive hearing loss. Individual bone conductor hearing aids, FM broadcast systems and sound field amplification are techniques that have been used to help Indigenous students with conductive hearing loss. When using individual FM systems, teachers wear a microphone around their neck that transmits directly to the student’s FM receiver. This improves signal-to-noise ratio, but can draw attention to the students using the equipment, and they may be reluctant to wear the receiver this reason. Also, the systems are often unpopular with teachers because they must provide associated technical support (personal communications from teachers and audiologists to the author at various times).

Sound field amplification, where the teacher and/or some students’ voices are amplified for the whole class, improves the signal-to-noise ratio for all students in the classroom. This is a distinct advantage for Indigenous students, given the likelihood that most Indigenous students will have experienced past conductive hearing loss, even if they do not have a current hearing loss. Modern sound field systems in use in schools have provision for a teacher and student microphone, so that the student’s contributions to structured student discussions are also amplified. Massie (1999) demonstrated the capacity of sound field systems to improve Indigenous students’ verbal participation in class activities.

However, amplification systems are seldom used outside the classroom, and children spend a significant part of their school day on playgrounds, where important social interaction takes place. As noted above, there is little
available information on the acoustic properties of, or noise levels in playground areas, or on how children with conductive hearing loss cope socially in the playground.

**Effects of noise on physiology and social behaviour**

Noise has been found to have a variety of effects, including physiological and social ones. Singer, Acm and Schaeffer (1990) found that noise can be regarded as a noxious stimulus that produces the same biological and psychological effects as other stressors. Evans, Bullinger and Hygge (1998) found that school children exposed to aircraft noise when their school is under a flight path experienced modest but significant increases in blood pressure and significant increases in stress hormones (epinephrine, norepinephrine and cortisol). In contrast, children living in quiet areas experienced no significant changes. Eighteen months after the opening of a new airport, children exposed to the chronic aircraft noise also reported a significant decline in their quality of life.

Noise has been found to affect social behaviour and social judgement. In experimental studies, people were found to be less willing to help others when noise levels were higher (Matthews & Cannon, 1975). The background noise levels at which people were less willing to help others was 85 dB, a level commonly reached on school playgrounds and in noisy school settings. Sauser, Arauz and Chambers (1978) found that subjects recommended lower salaries for fictitious employees when exposed to levels of office noise at 70 to 80 dB. Broadbent (1983) provides evidence that when asked to administer electric shocks to others, subjects will give each other more shocks when they themselves are exposed to noise. He also cites evidence that noise increases anxiety levels. A recent study in schools found that noisy schools may result in irritability among teachers (Evans & Maxwell, 2001).
The perception of control is a critical variable in any assessment of the adverse behavioural effects of high background noise. People who thought that they had some control over the noise showed significantly greater tolerance to noise than people who thought they had no control, even if the controlling power is never exercised (Glass & Singer, 1972; Singer et al., 1990). When speech is the disruptive noise and there is a perceived lack of control, even moderate noise levels can affect performance.

During experiments, subjects exposed to noise displayed reduced tolerance for frustration, increased anxiety, a decreased incidence of helpful behaviour, and increasing risk of hostile behaviour (Jones, 1989; Suter, 1991). The moderate noise levels described in this study are within the range of the levels often found in school environments, where children have limited ability to control the noise level or leave the environment. Further, these effects have been found among individuals without conductive hearing loss. Children with conductive hearing loss may be even more susceptible to the above-mentioned physiological, social and performance responses when they are in noisy classrooms and playgrounds.

**Background noise and conductive hearing loss**

While there is minimal information about the social effects of noise in classrooms, there is information on the effects of noise on speech perception at school. Students with normal hearing may function adequately in an acoustically marginal classroom; that is where there are high levels of background noise or otherwise poor acoustics. The ‘redundancy’ of spoken language (use of words that are not essential) and the ability of normal ears and brains to process sound, means that people can hear under adverse conditions. However, background noise tends to have a greater effect when the exposed individual has had less experience with language, perhaps
because of their youth or because they come from an ESL background. For instance, children, especially young children, find it hard to hear word lists when background noise levels are high (Smyth, 1979; Crandell et al., 1995).

Younger children need better listening conditions when the content and vocabulary of communication are new. Elliot and Powers (1992) found that for normal-hearing English-speaking children, words had to be voiced at higher dB levels than was necessary for adults: up to 25 dB higher than was necessary for normal-hearing English-speaking adults if they were to score 100 per cent in the tests. This means children may find it very difficult to hear in classrooms where the noise levels do not interfere with speech reception for adults (Plant, 1995). This is especially so for children for whom English is a second language (Crandell et al., 1995). Also, children with impaired hearing perform worse than children with normal hearing in their ability to hear words against background noise (Finitzo-Hieber & Tillman, 1978).

So, Indigenous children with hearing loss fit into several of the risk categories that apply to children who will find it more difficult to hear well when background noise is present. They are likely to have experienced persistent past as well as ongoing hearing loss (McCafferty et al., 1985). Many do not use English, and in particular Standard English, as their first language. They face constraints in their ability to exercise any degree of control in the school environment.

**Student conversations and classroom control**

Malcolm (1982) points out that, in schools, it is the adult teacher who decides social participation structures and thus the acceptable level of background noise. Because of the numbers of children who need to be managed, teachers generally exercise more control over students at school than parents do at
home. At school, children spend much of their day in relatively crowded and noisy environments, where teachers control social participation structures and background noise levels. The students themselves have limited ability to control the background noise or change their environment. Among adults with hearing loss, a common coping strategy is to avoid social situations where there are large numbers of people or intrusive background noise. This option is not available to children who compulsorily attend school.

The negative effects of background noise are greater when people feel that they lack control (Singer et al., 1990). Indigenous students have higher expectations of autonomy and control than is the case with non-Indigenous students (Malin, 1989, 1990). On the other hand, the standards that dictate the adequacy of the acoustic environment for children in school are decided by and controlled by non-hearing-impaired, Standard-English-speaking, non-Indigenous adults.

**Background noise, communication and social interaction**

One study has addressed the communicative consequences of high levels of background noise for Indigenous children with hearing loss at school. Lowell (1994) found that background noise did not impede communication for the group of Indigenous children she studied in an Arnhemland bilingual school. However, as noted in the previous chapter, this study took place in a very unusual school context.

The student participants in Lowell’s study attended a school where the language of instruction was the local Indigenous language, the teacher was a local Indigenous person, and classroom peers were a homogeneous group of children who had grown up together and most of whom were related. Class sizes were between 10 and 15 students, with two adults providing
educational support to the students. The teachers and children shared and understood an elaborate non-verbal communication system. For example, Lowell (1994) noted that Yolngu (Indigenous people from East Arnhemland) teachers often used Yolngu sign language in parallel with verbal communication. The shared experiential, cultural, linguistic, and non-verbal understandings that prevailed in the school were potentially powerful compensating factors that could combine to offset the effects of both hearing loss and the problems created by background noise.

However, a declining number of schools are of this type. In many places elements of bilingual instruction been diluted. More typical today is the school where a non-Indigenous teacher speaking Standard English teaches Indigenous children in a class where the majority of their peers are also non-Indigenous. The effect of background noise on Indigenous children with conductive hearing loss in this context is largely unknown.

**Summary**

This chapter has considered the implications of background noise for learning. Although noise levels in schools result largely from talking, researchers in the field of school acoustics have shown little interest in how social organisation in school can contribute to school noise levels. The researchers have shown more interest in the prevention of intrusion by external noise and in limiting reverberation in schoolrooms. However, studies have demonstrated that high noise levels can have physiological and social effects. Background noise is likely to have a greater effect on the classroom communication of children, especially Indigenous children, who are experiencing conductive hearing loss, than it will on other children. This research project examines the compounded effects of background noise and conductive hearing loss on the classroom social responses of urban
Indigenous children. In Chapter Six, research that is relevant to the general education of urban Indigenous children with hearing loss is considered and discussed.
SECTION TWO
LITERATURE REVIEW

Chapter Six
Indigenous students, conductive hearing loss and research issues
Chapter Six

Indigenous students, conductive hearing loss and research issues

This chapter reviews the results of the few studies that have been carried out into conductive hearing loss among Indigenous children. It also considers the limited relevance of studies of non-Indigenous children for Indigenous education, as well as methodological issues for research in this area. The sometimes divergent results reported in this chapter point to the cross-cultural context of classrooms as a critical variable in determining the extent of the disadvantage associated with conductive hearing loss for Indigenous students at school.

Delays in accelerated social development

A study of young children’s language development among Western Desert Indigenous children (Jacobs, 1986) described a sequence of language and social development that was different, and generally more advanced, than that found among non-Indigenous infants. For example, responsive smiling, the imitation of facial patterns and the localisation of the mother’s voice occurred at a younger age than they do among non-Indigenous children. The patterns of verbal and non-verbal communication were also different from those found among non-Indigenous children, and they developed at an earlier age. The closer physical contact with family members and strong social and communicative responsiveness towards children by members of the extended family (Jacobs, 1986; Hamilton, 1981) may have contributed to this accelerated linguistic and social development. Jacobs noted, however,
that there were comparative delays in the social and linguistic development of Western Desert infants who experienced chronic conductive hearing loss.

**Disruption and problems with participation in classroom talk**

Earlier research conducted by Howard (1990) was initially undertaken with Indigenous students who had recently come from remote communities but were in an urban class with a non-Indigenous teacher and an Indigenous teaching assistant. This study focused primarily on the students’ social participation in the classroom. A survey of teachers was used to identify the students’ teacher-oriented learning behaviour (TOLB), which was assessed with reference to student contributions to class conversations, their attentiveness in class, and the way the students responded to instructions and questions in class. An association was found between current hearing loss, low achievement and low TOLB scores. Students identified as having a hearing loss were often seen to use peer-oriented learning behaviours (mainly through observation of members of their student peer group) that appeared to help them to cope with classroom expectations.

The results suggested that current hearing loss was an educational obstacle for these Indigenous children. It affected their learning and/or ability to work with the verbally focused teaching strategies of the non-Indigenous classroom teacher. When the Indigenous teaching assistant used non-verbal teaching strategies these appeared more successful with the hearing-impaired students. However, the Indigenous assistant noted that the non-Indigenous teachers had been discouraging her use of these strategies because they thought the strategies she employed were ‘not good teaching practice’. The results of this work suggested that Indigenous students with hearing loss might benefit from access to more culturally congruent (Erickson, 1987) Indigenous communication styles and teaching practices,
with teachers matching their teaching styles to the students’ preferred learning styles.

In a later publication (Howard, 1992) I elaborated on the ways in which culturally responsive classroom practices could assist Indigenous students with hearing loss. I described a culturally responsive classroom as one that included informal, relationship-focused practices that allowed peer support to take place. Other aspects of this approach included respect for students’ culturally derived expectations, allowing them to exercise greater autonomy, and drawing from ‘real life’ skills and experiences in the classroom.

The research results also indicated that the learning of Indigenous students with hearing loss would be aided by classroom teaching practices that included visual and non-verbal communication strategies. The students with a current hearing loss were identified as the ones that were more demanding of teacher time, as they needed more individual support. They were also more often involved in disruptive behaviour that required intervention by the teacher than was the case with other students. I postulated that the behaviour of students with a current hearing loss had an indirect effect on the learning of all students in the class. They distracted others from their focus on the task they were working on and their teachers had to spend more time on one-to-one support and behaviour management activities.

The difficulty that Indigenous students face when participating in teacher-centred classroom discourse was confirmed in a later study (Howard, 2004). The study involved 167 children in nine classrooms in two remote area schools. A survey of teachers was conducted in conjunction with hearing tests. The survey forms were filled out by the non-Indigenous classroom teachers and the Indigenous teaching assistants. The results showed that the
students with a current hearing loss in both ears participated in classroom discourse at a significantly lower level than the other students for three of the four measures of this form of student activity (answering questions, making contributions and following instructions). High levels of participation in these three types of classroom discourse were found to be strongly associated with academic success. It is not surprising, therefore, that the students with hearing loss were found to require more individualised assistance than students with no hearing loss.

Students with bilateral conductive hearing loss were also significantly more disruptive in class than other students and were often involved in teasing - either being teased or teasing others. ‘Teasing’ is an important component of Indigenous social interaction (Harris, 1980). Appropriate teasing informs others of socially undesirable behaviour and exerts pressure for more socially acceptable behaviour. ‘Teasing’ is used with children and among peers to encourage responsible behaviour (Bavin, 1991; Hamilton, 1981). In 1992 when I asked a group of Maningrida teachers to consider the indicators of a child’s readiness to attend school, they nominated their capacity to cope with teasing as an important indicator (personal communication, 1992).

Experience as a school psychologist in Indigenous schools has led me to believe that while participating in teasing is an important element of normal social functioning, for Indigenous students, an excessive involvement in teasing or excessive reaction to being teased is usually indicative of social problems. This view is supported by Christie (1986), who described the challenge that behaviour management presents to the teachers of Indigenous children in remote schools as primarily one of managing exuberant students whose enthusiasm needs to be contained and bounded by school
expectations. A second, smaller group of children present behaviour problems that can be related to more general social problems:

These children are misfits in their own society. Out of school such children are by themselves or with younger brothers and sisters. The other children in their peer group don’t like them very much and you (their teacher) may not either. They are blamed for everything. The other children do love teasing them, you admit, but they overact. (Christie, 1986, p.121)

While Christie does not make any mention of hearing loss, the social problems that he outlined are typical of many of the Indigenous students with conductive hearing loss.

Common sense suggests that the association between conductive hearing loss and behaviour problems is because these students can not hear their teacher. However, the social functioning at school of children with hearing loss is a subject that warrants more attention, and especially so when such a large proportion of Indigenous children experience hearing loss during their schooling.

**Group effects in remote classrooms**

In many remote classrooms only 10 to 20 per cent of the class group have normal hearing (Couzos et al., 2001). In 1990, I considered situations where few members of a class group have normal hearing (Howard, 1990). In one remote school about a third of the students in most of the classes had normal hearing. In one early childhood class, however, there were almost no children with normal hearing. Teachers had found this early childhood class very difficult to manage. One teacher had resigned from his position, frustrated by the difficulties that he had encountered while working with the
class, and another had been transferred because of her inability to manage the class. The class group was working with its third teacher for the year, and that teacher was struggling to maintain order, let alone teach. The unmanageable nature of the class seemed to be related, in part, to the absence of a group of students with normal hearing who could understand the teacher and model what to do so the students with hearing problems could emulate them. This suggests that the proportion of students with conductive hearing loss in a class can influence the level of disruption and behaviour problems. When a class has few students with normal hearing this may restrict the opportunities that students with conductive hearing loss have to use peer observation and call on peer support to help them. These are mostly issues in remote communities where there is a high prevalence of middle ear disease or in schools where ‘streaming’ occurs.

As part of this study, I compared the hearing screening results for students at an Indigenous secondary boarding school with their achievement-based class placement (Howard, 1990). This showed that the streaming of the students according to achievement had had the effect of congregating students with hearing loss in the low-achieving classes. Almost half the class group in the low-achieving classes comprised students with a current hearing loss, while only ten per cent of the children in the higher achieving class groups had a current hearing loss.

Social problems as a classroom indicator of hearing loss

Interestingly, social problems have been found to be the best indicator when identifying Indigenous children with a current hearing loss. McPherson (1995) found that the most useful questions, when asked of teachers, were primarily ones concerned with the children’s interaction with others, and
more particularly, their peers. He also noted that children with hearing loss tend to be more socially isolated than their peers. He concluded that (p. 46):

It is probable that hearing-impaired children’s social status is affected by these difficulties and that the greater the loss (i.e. >30 dB HL) the more likely these difficulties are to occur (McPherson, 1995, p. 46).

One researcher in Indigenous hearing loss, Dr. Yonovitz, in a personal communication in 2000, reported that, when conducting work on hearing loss and literacy, he had found that behaviour problems were consistently identified as a major concern for teachers of Indigenous students with hearing loss. However, in some Indigenous school contexts, hearing loss does not appear to be associated with learning and behavioural problems.

**Few problems despite hearing loss in a bilingual school**

Lowell’s (1994) findings differ from those of most other studies. Her study is interesting not only for its results, but also because they diverge from the quantitative paradigms that have characterised overseas studies. Her work was informed by the tradition of educational anthropology and involved Indigenous educators as co-researchers.

Lowell’s interest as a speech pathologist was on communication rather than on social interaction. She reported that there were seldom observable communication problems related to a current hearing loss among students with conductive hearing loss in a remote bilingual school where ‘same-culture’ class groups were taught by a ‘same-culture’ teacher using the local language. The cultural and linguistic congruence between the Indigenous students with hearing loss and their Indigenous teachers and peers appeared to minimise the potential for communication breakdowns and social
difficulties in the classroom. Communication breakdowns were most likely to occur when hearing-impaired Indigenous students were interacting with non-Indigenous teachers speaking Standard English, and even these situations were often retrieved by the Indigenous teachers and peers. The use of elaborate non-verbal communicative strategies also appeared to minimise the communicative disadvantage faced by the children with conductive hearing loss.

There appears much to be learnt from Lowell’s work about how best to minimise the adverse consequences that do arise from conductive hearing loss in schools. Lowell’s work suggests that the adverse effects of conductive hearing loss can be minimised where:

- the language of greatest familiarity is the language of instruction;
- teachers are from the same cultural and linguistic background as the students;
- class groups comprise children from the same cultural background who have long-standing and deep relationships, both in school and out of school; and
- non-verbal communication strategies are employed by teachers and students.

While Lowell’s results suggest that there are minimal communicative or social problems associated with conductive hearing loss, they do indicate that it can lead to social problems. Some of the children with hearing loss in Lowell’s study were described as experiencing social or behavioural difficulty, for example, with teasing or a lack of confidence. Teasing by other children was common, especially for those with borderline hearing, and these students tended to be ‘easily upset’. This behaviour was often ascribed to social immaturity. For example, one child was said to ‘get cranky and act
like a small child’ (Lowell, 1994, p. 255). This sort of behaviour seemed most apparent among students with an inconsistent hearing loss. Some children with hearing loss were noticeably more confident with Indigenous teachers than with Balanda (a term used in East Arnhemland for non-Indigenous people) teachers. Children without hearing loss were observed giving cues to children with hearing loss, and Indigenous teachers also helped them. Several of these children were often seen with worried expressions.

Lowell’s work demonstrates the capacity of qualitative methodology to unravel the complexities of the often-discussed mitigating or risk factors involved in the adverse outcomes from conductive hearing loss. She identified powerful mitigating factors in bilingual classrooms that serve to minimise the effect of the problems associated with conductive hearing loss. However, it is only when her work is considered with the results from other studies that its importance is clear, as it shows that the problems commonly reported in other studies can be avoided.

**Amplification and a culturally responsive classroom**

Bilingual schools are relatively rare. A more typical classroom for most remote Indigenous students is one where the students are taught by non-Indigenous teachers using Standard English, which is different to the Indigenous English spoken by most students at home, in a wholly or mostly Indigenous class group. This was the context in which Massie (1999) carried out her work. While investigating sound field amplification (where the voice of the teacher or selected student is amplified for the whole class), her results say some important things about the powerful influence that classroom cultural contexts can have in relation to the disadvantage associated with conductive hearing loss.
Sound field amplification improves the signal to noise ratio: the voice of the speaker is amplified so that it is easier to hear what they say above the background noise. The system used by Massie included a teacher microphone and a microphone that could be handed around for the students to use. She found that with the use of this amplification system there was an increase in the number of communicative interactions by the hearing-impaired children, with both their peers and their teachers, in three classrooms taught by non-Indigenous teachers. Amplification helped the students with a hearing loss to increase their social responsiveness.

However, Massie (1999) noted that there was a lower incidence of communicative breakdown in a fourth classroom where an Indigenous teacher provided a culturally responsive learning environment. She described the culturally responsive practice in that classroom in terms of a social participation style that was less formal, less reliant on verbal strategies, and that encouraged observation, practical competencies and peer support. The communicative advantages experienced by the Indigenous students with hearing loss in this culturally responsive classroom meant that the introduction of sound field FM amplification had less impact on communication there than in the other classes.

Massie’s (1999) work helps to integrate and explain the apparently divergent results from differing school contexts. Communication seems to be more fragile for Indigenous children with hearing loss when they are in cross-cultural classrooms. The presence of an Indigenous teacher can reduce the extent of any communicative breakdowns and the incidence of social problems associated with hearing loss. Where there is no Indigenous teacher, amplification can help to minimise communicative breakdown. This work highlights the importance of the cross-cultural context of the classroom as a
critical variable in the development of communicative difficulties and social problems among hearing-impaired Indigenous students.

Massie (1999), Lowell (1994), Howard (2004) and Partington and Galloway (2005) suggest that an important way to address the disadvantage associated with endemic Indigenous hearing loss is for the affected children to have access to Indigenous teachers who are able to implement culturally responsive practice in classrooms. However, in my study in 1990, I suggested that there may be institutional factors that inhibit Indigenous teachers from using strategies that are known to be successful with Indigenous students with hearing loss (Howard, 1990). Massie’s (1999) work also suggested that, where there are no Indigenous teachers, sound field amplification can improve the quantity and quality of classroom social interaction and learning for hearing-impaired Indigenous children.

**Poor social and emotional outcomes**

The West Australian Aboriginal Child Health Survey (WAACHS) (Zubrick et al., 2006) was a large scale survey that examined the relationships between a range of health, social and emotional variables and educational outcomes. It found that conductive hearing loss was associated with diminished social and emotional wellbeing and poor speech and language development. However, there was no evidence of a direct relationship between conductive hearing loss and educational outcomes. The researchers concluded that three major factors had the greatest effect on poor educational outcomes. These were low educational attainment on the part of carers, high levels of absenteeism, and children’s’ social and emotional problems. As conductive hearing loss is associated with both poor social and emotional outcomes (Zubrick et al., 2006) and higher absenteeism (Couzos, 2004), the WAACHS
results suggest that the main influence of conductive hearing loss on educational outcomes is indirect. That is, conductive hearing loss influences social and emotional well being and absenteeism, which in turn influence educational outcomes.

As with the large-scale quantitative studies of non Aboriginal children, there are problems with the measurements used in the WAACHS study (Zubrick et al., 2006). The measure for conductive hearing loss was parental knowledge that children had, or had had runny ears (perforated ear drums). A runny ear is an imprecise measure of conductive hearing loss. Children can have middle ear disease and associated hearing loss without having runny ears. The effect of this measure would have been to diminish the degree of association between conductive hearing loss and other variables.

The most important caution to bear in mind with reference to the WAACHS results is the distinction between current hearing loss and past hearing loss. The study used an imprecise measure of past hearing loss. The influence of current conductive hearing loss on current learning can not be discerned from the survey results. Nevertheless, the study’s findings on conductive hearing loss as an influence on social and emotional wellbeing are important insofar as they draw attention to a subject that has often been neglected in other research. Unfortunately, the recommendations from the survey team, like those from many researchers in this area, had a health rather than an educational focus. The team concluded that while children should be treated for middle ear disease, they did not consider the possibility that schools could minimise the adverse social and emotional outcomes from conductive hearing loss to improve educational outcomes.
Conductive hearing loss and low literacy skills

Low literacy levels have been a major concern in Indigenous education. One study points clearly to the connection between conductive hearing loss and literacy (Yonovitz & Yonovitz 2000, 2002). This study involved extensive hearing assessments for over 1000 Northern Territory secondary school age Aboriginal students. The assessments included measures of the children’s auditory processing skills. These, as is outlined in Chapter One, can be affected by early childhood hearing loss. This study found that 80 per cent of the students had some degree of hearing loss, and that 38 per cent showed evidence of auditory processing problems. Students with a current conductive hearing loss had significantly lower literacy scores. The study also showed that modest improvements in literacy could be achieved by improving the phonics skills of the students.

A multifaceted literacy program

Partington and Galloway (2005) developed a broadly based literacy program after researching classroom best practice. They found that successful teachers taught phonics skills through primary school. They also explicitly taught world knowledge that helped readers to understand what they read about and how to use language appropriately in different social contexts. Successful teachers also relied on Indigenous styles of interaction that helped them to create a classroom environment that respected different ways of doing things. Important elements of this were:

- the use of indirect questions and information-gathering questions (seeking information that the teacher genuinely did not have);
- the use of group work and peer tutoring;
- giving the students more time to respond - longer waiting times; and
- the use of positive rather than negative reinforcement.
This work highlights the point that reading programs are likely to be more successful if they develop both specific phonics skills that build ‘bottom up’ syntactic reading skills, as well as semantic or ‘top down skills’ that develop children’s understanding of the context of the text they are reading. The results supplement our understanding of the influence that conductive hearing loss can have on both effective oral communication and literacy. It affects more than just speech perception and sound symbol correspondence. Conductive hearing loss can significantly diminish the capacity of Indigenous children to participate in culturally unfamiliar schooling. If schooling is to be successful for the many Indigenous students with conductive hearing loss, teaching must be adapted to culturally based preferred learning processes, and explicitly teach the children how to learn with Western teaching styles.

The following analysis of the outcomes of research into Indigenous conductive hearing loss supports the conclusion that the cultural context of schooling is an important determinant of educational outcomes.

<table>
<thead>
<tr>
<th>Major disadvantage associated with conductive hearing loss</th>
<th>Indigenous cultural context</th>
<th>Cross-cultural context</th>
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Poor access to limited support

A recurrent feature of the education sector is an inadequate institutional response to Indigenous conductive hearing loss. The findings of a recent review of health and education services to Indigenous children with conductive hearing loss in South Australia draw attention to this (Snodgrass, 2006). Some key findings from the review were as follows.

- The support services available were based on a special education model that had limited resources. While individual teachers and schools attempted to address the issues using the limited available resources, there was no focused or sustained institutional response to the needs of Indigenous students with conductive hearing loss in the education sector.

- Indigenous students frequently did not receive even the limited educational support available as they often did not obtain audiograms that would justify their need for support. A range of factors hindered Indigenous students being involved in audiological assessments. These included costs involved, the complex logistics of the referral process and parents not understanding the link between ear disease, hearing loss and education, as well as school hearing screenings that may prompt referral for an audiological assessment becoming less common in most schools.

- In the health sector there were a number of health programs dedicated specifically to addressing Indigenous children’s middle ear disease. The driving forces for these had been the priority and funding provided by the Commonwealth health department that enabled Aboriginal community controlled health services to establish dedicated ear health programs. In the education sector the
Commonwealth education department had not given the same priority to Indigenous hearing loss and in any case there were no equivalent Indigenous community controlled education organisations with established relationships in Indigenous communities.

- Another problem in providing a better educational response was the uncertainty among teachers of the kind of classroom strategies that could best assist indigenous students with conductive hearing loss.

Feedback from professionals working in this area in other parts of Australia indicates that a similar situation exists elsewhere, including the diminishing access to school hearing screening (personal communication with various professionals in Queensland, Western Australia and the Northern Territory).

**Issues of methodological interest**

**Indigenous educational policy and inconsistent research results**

Although the prevalence of middle ear disease among Indigenous children has been known for several decades, there have been few studies into its educational implications. In the absence of research based on the Indigenous population, policy and practice has been guided by research carried out with non-Indigenous populations. The inconsistent findings (Haggard & Hughes, 1991) from research among non-Indigenous children have justified the low educational priority given to Indigenous students with conductive hearing loss. There are methodological issues that may explain the inconsistent research outcomes among Western populations and also why these studies have limited relevance for Indigenous children.

Early studies in this area adopted a retrospective design. They considered current language, learning or social indicators, and the history of middle ear
disease. The problem with this type of research design is that hearing loss is generally not measured. Instead the studies focus on particular aspects of middle ear disease, for example the number of past instances of otitis media that required treatment. The extent of hearing loss that the children actually experienced was an unknown quantity. Also, the children in the control groups, who are assumed to have had no history of middle ear disease, may have experienced some asymptomatic middle ear disease. These uncertainties could have produced distorted results. Researchers sought to address these problems by conducting prospective studies that followed children over a period of time and produced accurate information on their ear disease history. However, these studies were still beset by methodological problems. Often, they still did not measure actual hearing loss and the research process itself introduced confounding factors.

When children are identified as having ear disease, they are treated. It would be unethical not to do so. However, this means that the children in the study group have a level of treatment that is not typical of the real world, and the treatment is likely to minimise the time that they spend with hearing loss. This lessens the likelihood that they will face negative outcomes from their middle ear disease. Further, the identification of actual or likely hearing loss is itself a powerful intervention. When parents, teachers and children know that hearing is impaired they are likely to engage in compensatory communication strategies that will help to minimise the likelihood of the negative outcomes associated with conductive hearing loss.

This is a difficult area in which to carry out methodologically ‘clean’ research. However, if we consider the nature of the inconsistent research findings there are a number of principles that can be used to help explain
why it is that it is only sometimes that middle ear disease leads to adverse educational outcomes.

1) The principle of ‘accumulated risk’ suggests that a combination of several factors must be in play if past hearing loss is to have a discernable future effect. For example, there will be adverse outcomes if poor school acoustics combine with hearing loss and limited family support (Haggard & Hughes, 1991).

2) The ‘critical stage’ principle suggests that early hearing loss has long-term consequences if it occurs during critical (usually early) stages of development. Hearing loss after the critical developmental stages has less effect (Haggard & Hughes, 1991).

3) The principle of ‘cumulative effects’ suggests that it is the overall time with conductive hearing loss during childhood that contributes to the development of long term auditory processing problems. Adverse later communication outcomes are most evident among those who experience extensive periods of hearing loss during childhood (Hogan & Moore, 2003).

4) The ‘later effects’ principle suggests that some effects of early conductive hearing loss do not become apparent until late childhood/early adolescence, when academic challenges become more pronounced (Sinclair & Jacobs, 2000). This is the stage of schooling when the requirement for learning from talking and reading becomes paramount.

5) The principle of ‘cross-cultural magnification’ suggests that communication and learning difficulties may only emerge, or may be
greatly exacerbated, when children from a minority culture are involved in cross-cultural communication. When communicating with familiar people from their own culture, culturally derived communication strategies can help the children to compensate for the communicative disadvantages related to any hearing loss (Lowell, 1994; Massie 1990). When culturally based compensatory support is not available there are more adverse communication and learning outcomes (Howard, 1990, 2004).

These principles help to explain the inconsistent results from past research. They also help to explain why Indigenous people are among those most likely to be at risk of adverse outcomes from early childhood middle ear disease. Indigenous children are at greater risk than other populations because:

- they experience middle ear disease and associated conductive hearing loss earlier in childhood and more often during the critical periods in their development (Boswell, Nienhuys, Rickards & Mathews, 1993);
- they experience hearing loss for longer periods, so they have a higher cumulative total period of hearing loss during childhood (McCafferty et al., 1985);
- they are subject to many cumulative risk factors, for example lower socio-economic environments, crowded noisy housing and schools with poor acoustics (SCRGSP, 2005); and
- as a minority cultural group, they are most likely to be involved in cross-cultural settings in education, health, the workforce and with respect to the legal system (SCRGSP, 2005), and it is in these situations that hearing loss will compound cross-cultural communication difficulties.
So, it would seem that, in Australia, Indigenous people are among the most likely to experience adverse linguistic, social, educational consequences from conductive hearing loss. It is important, therefore, that research into conductive hearing loss is focused on Indigenous children and that this research is used to guide the development of Indigenous educational policy and practice. Otherwise, Indigenous educational policy and practice will continue to be based on research carried out with students who experience far fewer exacerbating risk factors as well as far less middle ear disease.

**Measurement issues for Indigenous conductive hearing loss research**

When research is conducted among Indigenous people there are a number of methodological issues to consider. This is especially so with respect to the measurement of conductive hearing loss. While some of issues associated with the measurement of conductive hearing loss are the same for non-Aboriginal and Aboriginal children, others are affected by cross-cultural factors, and some are paradoxical.

1. As with research based on non-Aboriginal populations, there are difficulties with retrospective research designs which can not accurately measure the extent of past hearing loss. While students may have no current hearing loss, they may have had past hearing loss that has left a legacy of auditory processing problems, which in turn may leave them with functional listening problems that are similar to those with a current hearing loss.

2. There are also difficulties with prospective designs which seek to measure middle ear disease or hearing loss while at the same time intervening to remedy the middle ear disease uncovered. The research
involves intervention that, firstly, informs the family that a child has a conductive hearing loss and, secondly, acts to limit the time spent with hearing loss.

3. Finally, there are difficulties associated with parental reporting of hearing loss. The parents who know their children have had a conductive hearing loss are generally those who have sought medical intervention, or the children have had formal hearing tests. Many Indigenous families do not have easy access to these services. For those who do have access, medical intervention is likely to minimize the length of time that the child is affected by conductive hearing loss. Alternatively, the families may belong to an advantaged socio-economic group whose children experience less middle ear disease.

These views are supported by comments made by Indigenous trainees (Howard, 2005). Those who said that they knew they had conductive hearing loss as a child generally had the fewest functional listening problems as adults. Those who had the most functional listening problems as adults said that their families could not afford to see doctors, especially about things like earache. The paradoxical result is that Indigenous people who know they had conductive hearing loss during childhood may actually have had less conductive hearing loss than those who do not know whether or not they had it.

4. Indigenous people with conductive hearing loss are among the least likely to participate in research into the subject, because unfamiliar situations often provoke anxiety among those with conductive hearing loss. (Howard, 2005, 2006). Because of this anxiety, they may seek to avoid unfamiliar activities such as hearing tests. Sue Quinn, an
audiologist currently conducting research in Victorian prisons relates a story that illustrates this point. After coming to the testing room an Aboriginal prisoner refused to have his hearing tested as part of a research program. The prisoners were free to choose whether or not to participate. He had agreed to participate, but he had apparently misheard the explanation about the nature of the test. When he found it was a hearing test he walked out saying to those waiting “I thought it was a urine test (which were compulsory in the prison), but it’s a hearing test!” The others who were waiting called back “Yeah, that just shows you need a hearing test. You’re deaf!” (Sue Quinn, personal communication, 2006).

5. Children with conductive hearing loss are more likely to be away from school when any hearing tests are carried out because they have a higher level of absenteeism (Couzos et al., 2001).

6. Schools that are the least likely to participate in research into conductive hearing loss, or associated issues are those that have a high number of children with conductive hearing loss, whose needs they have difficulty meeting. Teachers may have many more demands placed upon them in classrooms where a high proportion of the children have conductive hearing loss (Howard, 1990). The recent West Australian Aboriginal Child Health Study (Zubrick et al., 2006) reported that it was in schools in remote areas, where there is known to be a high prevalence of middle ear disease, that the principals were most likely to decline to participate in that research program. The research imposed significant demands on classroom teachers. Principals in these areas were also the ones who most often reported
that the resources available to meet the needs of their students were inadequate (Zubrick et al., 2006).

It is probable that the significant numbers of Indigenous people with conductive hearing loss will be under represented in any research into conductive hearing loss, because they are not included in the research samples. When I discussed research into the social outcomes of conductive hearing loss (Howard, 1990), I noted that problems with the measurement of past conductive hearing loss means that caution should be exercised when interpreting research findings, and in particular those that show no significant association between conductive hearing loss and social and educational outcomes. For the reasons outlined above, there is a risk that there are ‘false negative’ results in this area of research. However, if an association between a social or educational variable and conductive hearing loss is found, less caution is needed. This is because there are fewer known confounding factors in the case of positive results, as it is unlikely that those with good hearing will avoid hearing testing, or be absent as often from school.

**Quantitative, qualitative and mixed research designs**

Haggard and Hughes (1991), in their review of research on this topic among the non Indigenous population, suggest that observational studies of small groups of children with histories of otitis media are needed to clarify findings that suggest behaviour problems can be associated with conductive hearing loss. Embedded case studies (which involve different subunits within a single case study) are useful in conducting research dealing with multidisciplinary, ill-defined, complex real-world-problems (Scholz & Tietje, 2002).
There is generally a close identification between the results from inductive approaches using qualitative data and deductive approaches based on quantitative data. This association can be so close that the data types are sometimes wrongly ascribed to descriptions of the research approach (Onwuegbuzie & Leech, 2005). However, quantitative data can be used with qualitative/inductive methods, and qualitative data can be used with quantitative/deductive methods. A combination of these methods can be applied as part of unitary mixed methods approach to research design.

The most salient distinctions between qualitative and quantitative research relate to their epistemology. Quantitative/deductive methods use a sampling logic of justification. The objective is to determine whether a hypothesis, specified at the outset, can be proven to be wrong. The statistical analysis of quantitative data seeks to determine whether the relationships between variables exist only by chance. In this type of research it is important to consider data with respect to the following questions.

- How representative is it as a sample of the overall population group?
- Are the data collected of sufficient size, and of the right type for the statistical manipulations that are used, to yield accurate probability levels?

Quantitative data are often collected in controlled experimental settings so confounding factors can be eliminated. With qualitative/inductive research, the variables themselves, as well as the nature of the relationships between them are often ‘discovered’ through observation in natural settings. Repeated observations of the same relationships between variables, especially observations drawn from different sources and using different data sources (triangulation), support the validity of the emergent hypothesis. Replication
is the basis for the logic used to justify the validity of the research and its results.

Those advocating a ‘mixed methods’ approach do not view these two alternative approaches as separate and incompatible, but as part of an exploratory-confirmatory continuum within which the purpose of the research dictates the research approach and the data that should be used (Onwuegbuzie & Leech, 2005). The proponents of the ‘mixed methods’ approach often refer to the essential pragmatism inherent in mixed designs; they reflect the reality and necessity of research conducted in complex real world contexts, such as schools (Creswell, 2003).

Some of the advantages of the ‘mixed methods’ approaches described by Creswell (2003) are relevant to this study.

- Numbers can be used to add precision to words and narrative.
- The research can generate and test hypotheses that emerge from the qualitative data.
- The research can answer a broader and more complete range of research questions because the researcher is not confined to a single method or approach.
- The research can add insights and understanding that might be missed when only a single research method is used.

However, mixed research designs may not be well-received by some paradigm purists. Some researchers hold the view that there is a basic epistemological incompatibility between the methods (Lincoln & Guba, 1985). Even where there is overt acceptance of the appropriateness of ‘mixed methods’ research design, research of this type can often be interpreted from the viewpoint of the research paradigm with which the reader is most
familiar (Creswell, 2003). This is a particular risk with research that uses quantitative data within an essentially qualitative research design.

In the past, qualitative research has tended to rely on observational data from real-world settings, recorded in notebooks. Technical developments, such as audiotape and videotape recording, have provided greater opportunity for precise examination of minute aspects of social interaction. This makes the use of mixed research designs, where quantitative data are used within a qualitative research framework, a more viable proposition. However, when quantitative data are embedded in a qualitative research approach, which does not set out an initial hypothesis, its use can appear purposeless and chaotic to some quantitative researchers. From a quantitative perspective, small quantitative data sets used in a replication logic of justification, can be inappropriately misjudged as deficient quantitative research design. It is important to understand, therefore, that in such qualitative research designs, the small quantitative data sets form a part of the replication logic of justification. They may be viewed as ‘numerical narratives’ that are increasingly possible because of advances in technology.

On the other hand, from a strictly qualitative viewpoint, the use of numerical tallies may offend sensibilities accustomed to expecting data delivered in the form of ‘thick description’. Lincoln and Guba (1985) quote Le Barre’s view that the use of numbers in some qualitative research results in ‘maimed wholes’.

Cultures are molar complexes, with reticulated meanings - that informants can tell us about best. Numbers here can only operate with ethically fragmented shards assembled from maimed wholes. (Lincoln & Guba, 1985, p.80).
Numbers do not describe the rich context within which they are collected. However, the role they play is perhaps best compared with that of an X-ray in the medical world. The numerical data probe through the soft tissue of the qualitative material to depict internal structures that are otherwise obscured from view, just as an X-ray does. While an X-ray image does not show us what the whole living breathing person looks like it does help us to see more easily important things that would otherwise be obscured. There is still a danger, though, that ‘mixed methods’ research approaches may be poorly understood, and even offensive, to purists who have a commitment to one or other of the two major research paradigms.

**Cross-cultural research paradigms**

Qualitative paradigms are often desirable in cross-cultural contexts, because quantitative approaches can be inherently problematic. A quantitative approach assumes that the important variables are known and that quantitative measurement of them is possible and reliable. However, in cross-cultural research, and especially when this involves disadvantaged minority groups, institutionalised discrimination can influence uninformed research questions in ways that result in deficit stereotyping. This potential problem is compounded by the use of measures (such as psycho-educational assessments) that systematically disadvantage Indigenous people.

Quantitative research designs ignore variables that researchers and research participants are initially unaware of, as these can not be specified at the outset of research. Unknown variables emerge more easily during qualitative research; although these unknown variables may still remain invisible in ethnographic approaches where the focus on the ‘emic’ perspective of participants can obscure variables that the participants have not recognised. For example, with unidentified hearing loss, other factors that interact with
it, such as background noise, the influence of which is also often unrecognised by students and teachers alike, may have an invisible influence on the classroom responses of students. An ‘etic’ perspective, such as that gained through non-participant observation, can be an essential component of research design when there are important unknown variables.

However, an examination of the ‘emic’ perspectives of teachers and students is also important to any understanding of educational outcomes that may be attributable to unknown variables. The way non-Indigenous teachers interpret the classroom behaviours of Indigenous students that may be related to unidentified conductive hearing loss can have a powerful impact on Indigenous children’s educational opportunities (Malin, 1990). Similarly, Aboriginal student perceptions of critical attitudes on the part of non-Indigenous teachers can undermine the teacher/student relationships that are crucial to educational outcomes (Partington et al., 1997). In these circumstances, researchers may need to adopt both an ‘etic’ perspective and an ‘emic’ perspective. They can use non-participative observation to explore the possibility that unknown factors are influencing student behaviour (‘etic’ perspective), and interview data to explore the attitudes of teachers and students (‘emic’ perspective) with respect to the social responses that are influenced by unidentified conductive hearing loss.

**Psycho-educational assessments in this research context**

Psycho-educational assessments have been used as a standard research tool in non-Indigenous educational research in this field. However, for a number of reasons, they may not be suitable to use in this research area with Indigenous students. Firstly, psycho-educational assessments have poor ecological validity when used with children with conductive hearing loss. Secondly, they have poor culturally validity when used with Indigenous
children. There is a danger that the data from such assessments may not only lack meaning, but may also tend to perpetuate negative stereotyping of Indigenous children. Thirdly, the forms of assessments and testing that are used must be relevant to the issues under investigation, appropriate for the sample group, sensibly applied, and produce intelligible results.

**Poor ecological validity**
The use of psycho-educational assessments has been widespread in research into past middle ear disease and future academic, linguistic, cognitive and behavioural performance (Haggard & Hughes, 1991). However, as has already been mentioned, the results from these studies have been inconsistent for a number of reasons. One further reason for the inconsistency of the results is because many of the studies have made use of psycho-educational assessments to measure outcomes. These assessments are carried out in quiet conditions and involve one-to-one communication. This is an ideal situation for children with listening difficulties because they can perform at their best. However, in noisy, multi-speaker classrooms children with listening difficulties may not be able to perform at the same level. Assessments carried out in ideal listening conditions will systematically minimise the real-life impact in classrooms of listening difficulties related to current or past middle ear disease. This view is supported by the more consistent findings when research designs are based on observations of children in real-life contexts (Haggard & Hughes, 1991).

**Poor cultural validity**
There is a long history of concern about the use of psycho-educational assessments that have been developed with, and use norms based on Western populations, when working with Indigenous students. These
concerns relate to the social context of the testing and to the content of the tests.

Kearins (1988) noted that for children from collectively oriented Indigenous cultures, the degree of relationship is all important, so when a stranger singles out children from the group to undertake tasks whose purpose is not understood, the result is usually a complaint but unmotivated performance. Implicit in the test protocols are Western social expectations that children will comply with requests and answer questions put by adults in positions of authority. However, in many Indigenous cultures this type of questioning is seldom used and children are afforded greater ‘rights’ of non-compliance with requests from adults (Malin, 1990).

It is also assumed that the children who are being tested have had exposure to the culturally embedded knowledge base that is being measured by the test (Kearins, 1993). For example, one of the questions posed in the most commonly used cognitive assessment at the time the data for this study were collected (the Wechsler Intelligence Scales for Children- Revised 1974) asks “Who discovered Australia?” with the correct answer being “Captain Cook”. Other questions involved knowledge that a child growing up in a Western home would be exposed to. However, if children have had relatively little exposure to the relevant knowledge, or have a different world view, the test results will not reflect differences in underlying ability but rather different levels of exposure to the requisite information. Furthermore, when the test is administered, both the explanations to the children and the verbal responses when these are required are in Standard English, and this is often not the first language of an Indigenous child.
**Unintelligible data**

Finally, it would be difficult to interpret the results of psycho-educational assessments meaningfully, especially verbal intelligence tests, in the context of this research. This is because children with hearing loss are known to perform badly in formal, language based assessments.

A group of non-Indigenous children with severe to profound permanent hearing loss were found to have lower scores than other children for verbal tests carried out using the Wechsler Scales of Intelligence (Wechsler, 1991). So it could be expected that the IQ scores of Indigenous children with current hearing loss, and who are likely to have a history of past hearing loss, will be generally lower than those of their classroom peers. An American study supports this contention. A long-term prospective study of conductive hearing loss among American Indian children, who also experience high levels of middle ear disease, found that the children with a history of middle ear disease or a current hearing loss had significantly lower scores on verbal tests using the Wechsler scales than did the children with no history of middle ear disease or no current hearing loss. A review of the use of the Wechsler scales with American Indian children suggested that the consistent 18-point difference found between their verbal and performance scores could be related to the presence of persistent conductive hearing loss among American Indian children (McShane, 1980). While there has been no comparable research with Indigenous Australian children, Lewis (1976) found that Indigenous children with a history of middle ear disease had lower scores on formal tests of English language verbal skills than Indigenous children with no history of middle ear disease.

It could be expected, therefore, that the Indigenous children with conductive hearing loss would perform poorly if tested on their verbal cognitive
abilities. Any cognitive deficits found by using such tests could not have been assumed to be independent of the children’s hearing loss. In these circumstances, the tests would not have been useful in generating ‘independent-of-hearing-loss’ explanations for their classroom behaviour.

The inclusion of formal assessments such as these in this research area is likely to encourage a focus on student deficits and divert attention from other factors in play in the classroom, such as noise levels and teacher perceptions of responses related to conductive hearing loss. The way educational psychologists often place children within an elaborate framework of identified deficits, using formal assessments, has not proved helpful as a way of addressing the educational needs of Indigenous children. Indeed, the inappropriate use of these forms of assessment may serve to perpetuate elements of institutionalized racism and distract attention from classroom interventions that might be useful in addressing disadvantage associated with conductive hearing loss. Tests that identify ‘deficits (that) are systematically linked to cultural variables (or pervasive disadvantage), may serve to perpetuate myths and stereotypes, which may in turn lead to increased marginalization, discrimination and exclusion’ (Drew, 2000, p. 326.)

To conclude, great caution should be exercised in using formal psycho-educational assessments in this research context because of their poor cultural and ecological validity, their limited interpretive value, and the danger that the results might be misused and perpetuate the negative stereotyping of Indigenous children. In this research context the use of psycho-educational assessments, such as intelligence tests, are likely to embody ‘unintelligent testing’.
SECTION THREE

METHOD

Chapter Seven

Research design
Chapter Seven

Research Design

Introduction

This chapter provides an overview of the research methods that were used in this study, which set out to investigate key issues in the provision of educational services to Indigenous students with conductive hearing loss. The two main issues investigated were, firstly, the link between current conductive hearing loss and classroom behaviour problems and, secondly, the difficulty of identifying whether students have a current conductive hearing loss or not.

In view of the complexity of the research task it was decided to make use of a comprehensive methodological framework known as an embedded case study; that is, a case study containing more than one sub-unit of analysis (Yin, 2003). This framework uses a mixed design that incorporates qualitative and quantitative data (Creswell & Plano Clark, 2007).

There were five research components in the embedded case study:

A) Two case studies of individual students with current conductive hearing loss, based on observational data obtained from video recordings and interviews;

B) Nine background noise studies which examined the verbal interaction of students with and without conductive hearing loss when it was noisy and when it was quiet, using mainly quantitative data (numerical counts) taken from videotape footage, to compare the
classroom responses of Indigenous students with and without current conductive hearing loss at different noise levels;

C) A qualitative examination of the social responses of the target students, those with current conductive hearing loss and often regarded as behaviour problems by their teachers;

D) An evaluation of the effectiveness of a speech reception game (Blind Man’s Simon Says) in identifying children with current conductive hearing loss; and

E) An examination of the amount of eye contact made by children with and without conductive hearing loss, during one-to-one conversation with their teacher.

Table 7.1 summarises the two approaches used and the type of data collected in each component of the study.

<table>
<thead>
<tr>
<th>Component</th>
<th>Type of approach</th>
<th>Data collected</th>
</tr>
</thead>
<tbody>
<tr>
<td>A) Individual case studies</td>
<td>Deductive</td>
<td>X</td>
</tr>
<tr>
<td>B) Background noise studies</td>
<td>Deductive, Inductive</td>
<td>X</td>
</tr>
<tr>
<td>C) Distinctive classroom behaviour</td>
<td>Deductive, Inductive</td>
<td>X</td>
</tr>
<tr>
<td>D) Evaluation of speech perception</td>
<td>Deductive, Quantitative</td>
<td>X</td>
</tr>
<tr>
<td>E) Face watching study</td>
<td>Deductive, Inductive, Qualitative</td>
<td>X</td>
</tr>
</tbody>
</table>
The schools

The research sites chosen for this study had to satisfy the following criteria: they needed to be urban schools (1) where a high proportion of Indigenous students were enrolled and (2) where hearing screenings were about to be carried out. Accordingly, three sites were chosen.

The reason for the choice of urban schools can be briefly explained. Most Indigenous schooling in Australia occurs in one of three different settings. A few remote communities have a two-way or bilingual program where a wholly Indigenous class group is taught by an Indigenous and a non-Indigenous teacher in both English and a local language. More commonly, in most remote schools a predominantly Indigenous class group, who speak Standard English as a second or subsequent language, are taught in English by a non-Indigenous teacher supported by an Aboriginal teaching assistant. Finally, in urban settings, a class group, in which Indigenous students are a minority, are taught in Standard English by a non-Indigenous teacher. Most Indigenous students in Australia are taught in the latter context and the research for this study was conducted in this type of school setting.

The first site selected (School A) was a large school in a satellite city on the outskirts of Darwin. This was a relatively new area and, in 1991, many of the Indigenous and non-Indigenous students attending this school had only recently moved to the area. At the time the research was undertaken, this area had a large stock of welfare housing. As all eight target students in the study attended this school, their classroom interactions were videotaped at this site. Four of the students had moved to the area recently with their families from interstate (Renee, Alana, Tina, Krystal); one had moved from elsewhere in the Northern Territory (Richard); and three students had lived in the area all their life (June, Kirsty, Sean).
The second site (School B) was a large urban primary school in Darwin with a large Indigenous student population, due to its proximity to a nearby urban Indigenous community. The Indigenous students at this school often came from remote communities, spoke English as a second or subsequent language and had mostly experienced schooling in all-Indigenous classrooms in the past. The videotape of students playing the game ‘Blind Man Simon Says’ was filmed at this school.

The third site (School C) was a middle-sized Darwin urban primary school in a community with a large, stable, urban Indigenous population. Indigenous students often attend it throughout their primary school years like their older brothers and sisters before them. Some classes in this school have a reputation for catering well for Indigenous students. It was at this school that classroom organisation strategies were observed, in a search for ‘best practice’ strategies to meet the needs of Indigenous children with conductive hearing loss.

The students
The classes chosen for the collection of research data included early childhood, middle primary and upper primary class groups. Classroom data on the eight target students were collected from eight classrooms in School A. The actual selection of the target Indigenous children with conductive hearing loss took place after hearing tests had been carried out. This constituted purposeful sampling (Patton, 2002); that is, care was taken to choose individuals whose behaviours and responses would be ‘information rich’. In this case, because their known hearing loss was known, classroom behaviours that might be related to conductive hearing loss could be examined. Another criterion used to select the target students was that the sample should include male and female students from each of the selected
age groups, or school grades. A further practical consideration was that the students had to be well featured in the recorded videotape footage. The often-unmanned videotape recording process therefore introduced a random element into the final selection of the target children.

For the background noise studies, research data were gathered on some Indigenous students without hearing loss to compare their classroom responses with those of the target students. These control students were selected on the basis that they were same-sex Indigenous students who had passed the hearing screening test and were within range of the video camera, but not in the immediate proximity of the target student. This was to ensure that target and control students, although located in the same general area, were not involved in social interactions with each other while the data were collected.

Family information was not gathered for the target students, but it is probable that their families had fewer resources and poorer access to educational services than did the families of their non-Indigenous peers. The House of Representatives Standing Committee on Aboriginal and Torres Strait Islander Affairs (1992, pp. 14-16) reported, at about the time that the research data were collected, that Indigenous people in urban areas are often unemployed, or in poorly-paid, low-skill and insecure jobs. The committee’s report noted that urban Indigenous children are less likely to attend preschool, often leave school earlier and are less likely to be involved in training than other urban Australian children. Furthermore, they tend to live in lower quality, more crowded and less secure housing than other urban Australians.

The students at the first and third schools were the most typical of urban Indigenous students elsewhere in Australia. Students at the second school
were less typical, particularly when compared with students who had grown up in urban areas, because many of them had moved to the area from remote communities.

Discussions with families and teachers at the schools revealed that the target students at the first and third schools, where the classroom observations were made:

- were usually of mixed Indigenous and non-Indigenous descent;
- often had family members who were part of the stolen generation;
- often spoke Aboriginal English rather than Standard English as their first language;
- in several respects they lived lives that were culturally distinct from those of non-Indigenous people, in ways that included a stronger focus on family and greater involvement with members of their extended family, distinctive styles of social interaction and family life, and a tendency to observe different norms of social interaction; and
- frequently exhibited a strong interest in sport.

The target students, as is often the case for Indigenous students living in urban areas, all displayed a high degree of cultural differentiation in their relationships and values compared to non-Indigenous students. This differentiation is evidence of a cultural continuity between Indigenous people who live in remote communities and those in urban environments (Malin, 1989). However, the associated cultural differences are often invisible to the non-Indigenous teachers and peers with whom they share their classrooms (Hudspith, 1992).
Types of data collected

Both qualitative and quantitative data were collected in this study. Diagram 7.1 summarises the types of data collected.

The quantitative data collected included:

- hearing assessment by pure tone audiometry and tympanometry;
- classroom sound levels measured by sound level meter during videotaping; and
- quantification of behaviour by tallying specific videotaped responses of students with and without hearing loss in both natural and contrived settings.

Hearing assessments

Hearing screenings were carried out with all the Indigenous children and those who failed the screening undertook full audiological assessments. These results were used in the selection of the eight target children (those with a current bilateral hearing loss) and the eight control children (who had
passed the screening and did not have any current conductive hearing loss).

The audiological assessment results of the target students are outlined in
Table 7.2. There are no audiological test results for control students
presented because formal audiological assessments were only carried out on
students that failed the school hearing screening.

Table 7.2  Audiological assessment results for target students

<table>
<thead>
<tr>
<th>Student</th>
<th>Grade</th>
<th>Hearing Loss</th>
<th>Middle Ear Function</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Richard</strong></td>
<td>Grade five student</td>
<td>Mild hearing loss in both ears</td>
<td>Bilaterally reduced middle ear function</td>
</tr>
<tr>
<td><strong>Alana</strong></td>
<td>Grade one student</td>
<td>Mild hearing loss in both ears</td>
<td>Bilaterally reduced middle ear function</td>
</tr>
</tbody>
</table>
| **Kirsty** | Grade one student | Left ear moderate to severe loss | Right ear mild loss
Bilaterally reduced middle ear function |
| **Janet** | Grade one student | Mild hearing loss in both ears | Bilaterally reduced middle ear function |
| **Sam** | Grade two student | Mild hearing loss right ear | Moderate hearing loss left ear
Bilaterally reduced middle ear function |
| **Renee** | Transition student | Bilateral moderate conductive loss | Bilaterally reduced middle ear function |
| **June** | Grade five student | Mild hearing loss in both ears | Left ear small perforation
Right ear reduced middle ear function |
| **Tina** | Grade five student | Bilateral moderate conductive loss | Bilaterally reduced middle ear function |

Note: real names have been changed to protect the identity of students.
The target students were selected from among those who had a current bilateral hearing loss. Specifically, they fitted the definition of children with a mild bilateral hearing loss (25 dB).

Staff working in the Northern Territory Hearing Program carried out hearing tests as part of a program of school testing that has since been abandoned. The hearing tests involved pure tone audiometry testing (at 0.5, 1.0, 2.0 and 4.0 KHz) in a soundproof booth, as well as simple otoscopy (looking at the eardrum) and tympanometry (measuring the ability of the ear drum to move when there is positive and negative pressure in the ear canal). The hearing data came from a single assessment of the students’ hearing.

Given the likelihood of persistent past hearing loss among the target students, it must be assumed, even if it can not be known, that at least some of the students had central auditory processing problems as a result of persistent past conductive hearing loss. Also, it is probable that students selected on the basis of a one-off hearing test would have included those who were most likely to have experienced persistent hearing loss in the past and to have associated auditory processing problems. These problems, where present, would also have affected the social responses identified in this study.

**Classroom sound levels**

Measurements of background noise levels in classes were not made until it became apparent in the early stages of the study that background noise needed to be an essential research focus. Sound level measurements were made in all eight classrooms. Measurements of classroom noise levels were made in two ways. Approximately 40 per cent of the classroom noise level measures were obtained using a sound level meter (SLM) placed in front of
the video camera, so that the videotape images included the SLM reading. Other measurements of noise levels were made directly from the sound recorded on the videotape.

These forms of sound level measurement are basic, but they were adequate for the comparisons needed in the study between generally noisy (above 70 dB) and generally quiet times (below 70 dB) in the classrooms.

**Videotape Recordings**

Sixty hours of video recordings were made and 42 hours of video were of sufficient quality (good audio and students of interest within the range of the camera) to be used in the research. This video footage was viewed and selected parts transcribed or used for particular specific components of the research. For example, 185 minutes were used in compiling the background noise studies and 80 minutes were used in the evaluation of the Blind Man’s Simon Says.

The use of videotape data helped, to some extent, to overcome the risk of adult teacher-centric perspectives affecting the classroom research. Schratz (1993) described videotapes as a research tool that helps researchers to ‘hear student voices’ in classroom research, where teachers’ perspectives can otherwise predominate; for example, during research into school behaviour problems. Videotape data make it possible for researchers to transcend the limitations of data based on surveys or interviews that will almost certainly reflect the interests of particular teachers, and limited observational opportunities, so that they can ‘see and hear a different version of social life than is otherwise possible’ (Schratz, 1993, p. 103). In this research context, the videotape data also allowed the researcher to watch what happens when children are unable to easily ‘hear other voices’ in the classroom.
Videotape recordings also have the advantage that they can be used to examine social responses in real-life settings. This overcomes the problems that are inherent in the use of measures, such as psycho-educational assessments, that are based on students’ responses in quiet one-to-one settings. As is explained in Chapter Six, such measures have poor ecological validity if aspects of the school environment, such as background noise, are likely to be mediating variables that should be considered in any research into the effects of conductive hearing loss. Psychometric assessments also have poor cultural validity with Indigenous students because they often use measures that assume exposure to a Western knowledge base through social processes that are unfamiliar to Indigenous children.

The videotape recordings also provided data in a form that could be revisited after the research focus had been clarified. This meant that the videotapes could be re-examined retrospectively to explore new hypotheses in a way that is difficult with notes taken during observations, as these will invariably reflect the issues that were seen as important at that time. For example, when background noise was identified as a relevant issue, the videotape recordings were re-examined to gather relevant data.

Numerical tallies were made of a) the number of times students spoke and how many of these were self instigated and sometimes b) the amount to time spent in verbal conversation. The researcher undertook the numerical tallies taken from the videotape data, and an Indigenous research associate completed a selection of counterpart tallies for validation purposes. An inter-rater reliability check on the background noise studies was conducted. This showed that there was 100 per cent correlation between the two measurements of the number of times students spoke and a 95 per cent correlation between the two measurements of the length of time they spoke.
The videotape data collected during the study ‘captured’ the social interactions and behaviour of the targeted children and those around them in. This information was collected within a two-week period following the completion of the audiological tests. This made it possible to ensure that videotape information on classroom social interactions were gathered for students with an identified current, bilateral hearing loss. To collect as much information as possible on as many students as possible, three video cameras were operated simultaneously in different classrooms. As there was only one camera operator, the cameras were often left unattended while running, and this limited the quality of some of the data (for example, when children moved out of the picture). While this data collection strategy did result in some low-quality video footage, it generally resulted in more high-quality data on more students than would have been possible if two video cameras had not been run without an attendant operator.

The sound accompanying the videotape footage was generally recorded using built-in camera microphones, but in some group situations these were supplemented with a PZM microphone. This omni-directional microphone recorded group verbal interactions more effectively than the uni-directional microphones built into the video cameras. However, some of the video footage did not include any sound, because the PZM microphone connection was found to be faulty early in the data collection period and was replaced. The majority of video footage was of classroom activity. However, other activities were also recorded. These included school assembly, physical education activities, library time and transits between these different school activities. One evening meeting of Indigenous parents was also recorded.

After an initial viewing of the entire videotape footage, sections suitable for transcription were selected on the basis of the quality of the audio and visual data. The two principal criteria used to select the actual footage for
transcription were that the target students were (1) consistently within the frame and (2) involved in social interaction.

Most of the videotape recordings were of naturally occurring school events, but there were two exceptions. The first of these was an evaluation of the hearing loss identification procedure called ‘Blind Man’s Simon Says’. This evaluation involved groups of four to eight students, who stood with their eyes closed and followed directions called out by the researcher from a short distance away. A research associate, who was unaware of the formal hearing test results, watched the videotape footage to identify those children who had difficulties trying to follow the directions given to them during the game.

The second exception was a ‘setting’ created by the researcher (two chairs in a quiet area outside the classroom) where the students and teachers were video-taped while conversing with each other. The researcher set up the camera and then ‘looked after’ the class while the teacher spoke to selected students. The aim of this procedure was to allow the researcher to examine the amount of eye contact between nine students and their teacher during nine one-to-one conversations arranged as part of an investigation of the use of visual coping strategies by students with conductive hearing loss. This study focused on students from one classroom after the researcher noticed that those with current hearing loss appeared to face watch more than other Indigenous students without hearing loss.

**Interview data**

The researcher conducted 33 unstructured interviews, to explore what had been observed of the children’s social responses. These interviews were held
with the target students (8), teachers (12), principals (3), students’ peers (5), and some parents (5). In preparation for the study, two Indigenous teachers and three non-Indigenous teachers were also interviewed to explore issues associated with urban Indigenous education. The material from these interviews was referred to in an earlier publication (Howard, 1994).

The interviews were carried out at times that would be least disruptive for school activities. For example, Richard was interviewed after he had been sent out of the classroom for disruptive behaviour. Appointments were made with teachers. Parents were contacted and asked to come to school, or approached during a parent evening held at the school. During the interviews students were asked for their own views on their school experiences and the way their hearing loss had affected them. With the permission of the target students, some of their friends were asked about their perspectives on the target students’ behaviour patterns, and if they thought these were influenced by the hearing loss.

The interviews were used to explore teacher and student perspectives on the social responses and communication difficulties of students with current hearing loss. In this was they helped to complement and elaborate on the video data. This supplementary information helped to identify the longer-term social processes that could be attributable to the communication difficulties that were evident in the videotape data. For example, June, a target student, was observed, on videotape, taunting her peers verbally in class. When interviewed, she explained that she believed that some peers who did not have a current hearing loss sometimes excluded her by whispering, even though they denied it. Since this happened mostly in noisy school contexts, it appeared that her difficulties with speech perception, as a
result of her hearing loss, were leading her to the conclusion that her peers wanted to exclude her.

The interviewer sought to adopt a position of ‘empathetic neutrality’ (Patton, 2002, p. 49). To assist with later analysis interviews were taped, and selected segments of the tapes were transcribed by professional transcribers.

**A) Individual case studies**

Two individual case studies were undertaken; one of a lower primary school student and the other of a student in upper primary school. The case studies were compiled using observational data derived from videotape recordings and eight open-ended interviews. The students were partly selected on the basis that one was in upper primary school and one was in lower primary school, but also because extensive video and interview data were available for each student. The open-ended interviews explored the interviewees’ observations about the students’ behaviour, as well as their own and others’ attitudes and beliefs about that behaviour. Both of the class teachers were interviewed, as were the librarian, two support teachers, two other students and one parent. School records were also examined.

The data were analysed by identifying consistent patterns of behaviour and themes evident in these patterns of behaviour. Data were placed in a software database (Filemaker Pro) that enabled coding of data and collating similar coded observations in a similar way to the way that qualitative data analysis programs operate. These were then tested by seeking instances of behaviour which confirmed, or did not confirm the emerging patterns. For example when a student was identified as often calling out in class, other instances of this behaviour were noted and the extent of this behaviour was then compared with the amount of calling out engaged in by peers. After the
compilation of the two individual case studies, the patterns and themes that emerged in each study were compared. The emerging themes are summarised in Table 7.3.

**Table 7.3  Themes in the two individual case studies**

<table>
<thead>
<tr>
<th>Theme</th>
</tr>
</thead>
<tbody>
<tr>
<td>Difficulties with listening, and prone to misunderstand things</td>
</tr>
<tr>
<td>Experienced social difficulties</td>
</tr>
<tr>
<td>Concerned about their social inclusion in the classroom</td>
</tr>
<tr>
<td>Often called out in class</td>
</tr>
<tr>
<td>Often told on peers</td>
</tr>
<tr>
<td>Often teased others</td>
</tr>
<tr>
<td>Sensitive about being seen to fail</td>
</tr>
<tr>
<td>Experienced more difficulties when it was noisy</td>
</tr>
</tbody>
</table>

The consistent behaviours demonstrated by with these two students were then discussed with other professionals, parents and students to determine whether or not the students’ behaviours were also evident among other children with current conductive hearing loss, and to assess teacher, parent and students’ perspectives on these behaviours. This secondary input was used to refine the analysis of the case studies. These forms of peer consultation and pattern matching (Creswell, 2003) were strategies that were used to enhance the validity of the data collected.

**B)  Background noise studies**

Nine background noise studies using numerical tallies were compiled from the video data. These were based on an examination of students’ interactions during a variety of lessons, as well as in other school contexts; for example, during school assembly and when moving between classes. The aim of these
background noise studies was to test the first hypothesis to emerge from the observational data; namely, that the level of background noise was an important factor influencing the verbal communication of children with current conductive hearing loss.

To test this hypothesis, the verbal interactions of Indigenous students with and without hearing loss were compared at different levels of background noise levels. The video data were examined to identify suitable sections of video footage. The criteria for selecting the video footage used in the Background noise studies were that:

- the target student could be observed during the time period selected;
- an Indigenous same sex peer who had passed the hearing screening was available for observation during the time period selected; and
- there was a variation in background noise levels from high to low during the time period selected.

Because it is easier to depict patterns of verbal interaction chronologically and numerically, at different noise levels, instead of through long narrative description, a series of quantitative background noise studies were constructed from the video data.

Each background noise study compared the number and length of verbal interactions involving an Indigenous student with a current hearing loss, against those of a nearby, but not adjacent, same-sex Indigenous peer who had passed the hearing screening test. The data for each of the student pairs was collected during the same period of time. The data collated in each of these studies yielded a two-by-two table that could be analysed using a chi square test to determine if there were significant differences in the verbal
interaction patterns of the Indigenous students with and without a current conductive hearing loss. A chi square test is a non-parametric statistical analytical tool that is useful with small samples, and can be applied to variables whose distribution in the normal population is unknown.

Although the quantitative data were analysed using a statistical technique, this was done within a qualitative research design framework – as part of an embedded mixed method case study design (Creswell & Plano Clark, 2007); that is, the results of this statistical comparison were used within the context of a qualitative ‘replication logic of justification’ (Yin, 2003). As discussed in Chapter Six, the replication logic of justification involves a determination that similar patterns of behaviour are evident in similar situations. This epistemological process differs from the ‘sampling logic of justification’ used in quantitative research, which draws on quantitative analysis that assumes knowledge about the normal distribution of variables within a population group.

There were nine background noise studies. Observational data were also used to support or disconfirm the quantitative data as part of an integrated analysis. Observations of target students’ classroom responses at different noise levels were considered to gauge whether they confirmed or disconfirmed of the results of the numerical counts in background noise studies.

C) Distinctive classroom responses
The video data and interviews were examined for evidence of consistent patterns of behaviour by the eight target children, and for any themes evident among their behaviours. Any seemingly consistent patterns were
tested by seeking conforming or non-conforming instances across the data. Any evident patterns were compared and discussed.

As with the individual case studies, any consistent behaviours demonstrated by these eight students were discussed with other professionals, parents and students to determine whether or not they were evident among other children with current conductive hearing loss, and to explore teacher, parent and student perspectives on these behaviours. This input was also used to refine the interpretation of the results.

D) Evaluation of speech perception

Prior to the commencement of the research it was apparent that a key problem in providing educational support to children affected by hearing loss was to identify those whose hearing loss was current. Since conductive hearing loss fluctuates, regular audiological screening is required, but is usually not available. To overcome this barrier to the provision of educational support, a speech reception game called ‘Blind Man’s Simon Says’ was developed. However, to determine the game’s efficacy in identifying children with current hearing loss it had to be evaluated against the results from formal hearing tests. This component of the research used a quantitative research design. An accompanying hypothesis was put forward; namely, that by analysing children’s responses during this game it would be possible to identify the children who had a current hearing loss, as independently determined by the results of formal audiological assessment.

A video recording of Indigenous students playing this game was made at one of the schools where the hearing tests were to be carried out with Indigenous students. The video recording was then examined by a teacher
who was asked to select the students who may have had a hearing loss, based on their responses during this game.

The evaluation of the hearing screening game used standard approaches to calculate its sensitivity and specificity. ‘Sensitivity’ refers to the effectiveness of a measurement in identifying those with a condition, in this case a current hearing loss. Good sensitivity would mean there were few children who had a hearing loss that the test failed to identify; i.e., the game resulted in few false negatives. ‘Specificity’ refers to the accuracy of the test in excluding children who did not have a current hearing loss; i.e., the game resulted in few false positives. Standard arithmetic algorithms were used in line with the conventional procedure for determining the efficacy of a screening procedure (Blind Man Simon Says) compared with a standardised test (formal hearing tests). These algorithms yielded percentage scores of sensitivity and specificity.

E) Face watching study
This component of the study was developed after classroom observations showed that some Indigenous students with current conductive hearing loss appeared to watch the faces of those they were listening to more than Indigenous students with no current hearing loss did. To test this proposition, a group of nine children from a single classroom (three Indigenous students with current hearing loss, three Indigenous students with no hearing loss and three non-Indigenous students with no hearing loss) were video taped talking individually with their teacher just outside their classroom. The amount of time each child spent face watching was then calculated from an examination of the video recording.
The quality and credibility of the method

The validity of research is determined by the degree to which a researcher’s conceptualisation of a situation conforms to reality. In other words, is it accurate? In this study the use of data from the study of a number of children, different schools and school contexts, and from different data sources, contributed to the validity of the research.

Data for the target children were gathered during different types of lessons (language, maths, science, art and silent reading) and in non-classroom contexts (during the school assembly, while they were involved in sport, and moving about in the gym, playground and corridors). Data were gathered by observation, using videotapes and in interviews with students, teachers and parents. This involved triangulation of both sources and methods. Videotape data were viewed repeatedly to ensure that the transcription and numerical counts were as accurate as possible.

One component of the research involved the evaluation of the hearing screening game, ‘Blind Man’s Simon Says’. The game’s efficacy in identifying hearing loss was compared with formal hearing tests. Patton (2002) lists four criteria for the evaluation of hearing tests. These are utility, feasibility, propriety and accuracy.

- This hearing game was useful (it had utility) in that, if accurate, it is a tool that will help teachers to identify children with conductive hearing loss that will not show up in other currently used screening programs (for reasons explained elsewhere).

- The game test was easy to carry out at minimal cost (thereby meeting the feasibility criterion), in part because of its name. When they hear the
name of the game most children understand and know how it will be played. This is important when it is used with children who may have difficulty understanding verbal instructions.

- The game was an easy one to play in ways that are fair to the children and ethical (thereby satisfying the propriety criterion). The game treated all students in the same way and, indeed, the use of the game actually promoted equity and social justice in that it helped to identify Indigenous children who may be eligible for services that they might otherwise be excluded from receiving.

- Finally there is the question of technical adequacy (accuracy); did the game do what it is said to do? This question is addressed in Chapter Ten.

This thesis is unusual in the length of time that has passed since the data were gathered. This time has been used to present the results to, and discuss them with classroom teachers, specialist hearing advisory teachers and families. This consultation process has involved the peer review processes that can be used to improve the validity of qualitative research (Creswell, 2003). During this process the research results gained widespread support from those teachers and specialists in the Northern Territory, Queensland, South Australia and Western Australia who have participated in workshops held to discuss the research and its findings. The training programs based on the research results and implemented in different places in Australia have also included elements of the ‘peer review’ and ‘pattern matching’ processes that support the validity of the research findings (Creswell, 2003). The comments made by peers also support the utility of the theoretical perspective that has resulted from the research.
The following comments are drawn from information in the evaluation reports completed by participants in training sessions.

The participants were able to readily identify the issues that Damien talked about, that is, the links between conductive hearing loss and learning, behaviour, auditory processing problems and social development....

In the past conductive hearing loss has not been recognised as impacting so much on student learning as say, sensori-neural hearing loss. However our teaching is showing that these students are very much at risk of not completing schooling nor achieving their potential. Damien’s cutting edge research and his practical strategies and resources are highly valued in the Teacher of the Deaf profession. (Coordinator Australasian Association of Teachers of the Deaf South Australia.

This training has been very well received by both Aboriginal and non-Aboriginal staff. His work, which I understand is based on his doctoral thesis in this area, brings a new and beneficial perspective to issues in Aboriginal education. Understanding the role of hearing loss in learning and behaviour problems makes a significant contribution to the theory of Aboriginal education.

Damien’s work also provides new approaches to classroom behaviour management. He has managed to link the extensive theory behind his research to practical strategies for teachers working with students, indeed a rare feat these days. (Principal of Principal Indigenous Education and Training Alliance Queensland)
In addition, school based programs, based on the research findings, have been implemented successfully in some urban schools. Such positive outcomes represent strong support for the validity of the findings.

One Indigenous teacher described the success of the program as well as its personal importance.

After receiving the full day training session with Damien, myself and teachers from ‘X’ State School (name withheld to preserve confidentiality) began the Healthy Ears project to assist students with Conductive Hearing Loss (CHL). The project aims to improve their behaviour and achieve better outcomes in literacy and numeracy. Damien’s training has provided us with skills to identify and support students with CHL....This project has been so successful that it is currently being implemented at ‘Y’ State School and ‘Z’ State School.

Training provided by Damien has also helped with issues in my personal life. I have suffered tremendously with CHL and as an adult today it still has a great impact on my life. It has been wonderful to be able to label why I have such difficulties communication and listening. It has also assisted my daughter and myself who is seven years old. As I am aware that she is experiencing the same problems as myself. The training has provided us with strategies to deal with it effectively.

(Indigenous specialist advisory teacher, Queensland)

One peer reviewer of an article based on the research results that indicate that effective ‘face watching’ by a pupil can mask teacher awareness of the pupil’s hearing loss, commented that they had encountered such situations in their own work as an audiologist.
Ethical considerations
The original research proposal for this study was submitted and approved by the Northern Territory Education Department’s research section and the then Northern Territory University education faculty. Permission for children to be involved in the study was sought at the same time as parental permission to conduct the hearing tests. Permission was sought from all parents in the schools where the research was undertaken. A letter informed parents of the research and asked parents to contact the school if they did not wish their children to be videotaped. None did so. Although this type of negative permission is not ideal, it was the only practical approach. The project was also discussed with, and support for it was sought from a group of Indigenous parents at a meeting of one school’s Indigenous parents committee. The names of the children and schools have been changed to protect the students’ identity.

Obstacles to research
The multi-disciplinary and multi-sectorial nature of research in this field presented a number of obstacles. So did the limited resources that were available. Although the prevalence of hearing loss among Indigenous children is a well-known fact, there has been minimal research in this field and there are very few academics or professionals with expertise in this trans-disciplinary area. Health professionals and services focus on middle ear disease as a health issue. They seldom consider the social and educational consequences of hearing loss. Education and audiological professionals focus on the needs of children with permanent sensori-neural hearing loss. They are not trained to understand the education issues associated with conductive hearing loss, indeed there is little information to inform such training. The neglect and marginalisation of this issue has adverse consequences when attempts are made to conduct research in this field.
• There is not a dedicated literature base that can be used to identify important issues in the subject area, or identify literature from other sectors that may be relevant.
• There is a very small network of academic or professional peers who can engage in informed discussion about the issues.
• The development of research designs and evaluation of results can be difficult because so few academics are familiar with all of the disciplines involved.
• The investigation of an issue that has been ignored and challenges the academic status quo in Aboriginal education can be threatening for some, while others may be disinterested in a new potential problem they know little about.
• New research tools must be developed to work effectively in this multi-disciplinary subject area; for example, the concurrent use of sound level meters and video equipment in classrooms.

Most notably, however, this project relied on access to hearing assessments carried out by other people. This meant that the classroom data-gathering process had to fit in with the programs for the hearing tests that were being conducted in the schools. It was constrained by the location, extent and timing of those tests.

Limitations of the study
The key limitations of this study include:
• its design, which precluded the gathering of more detailed information on student perspectives;
• the lack of input from Indigenous perspectives;
• the limitations on the amount of family information that could be accessed; and
the limited hearing data available for the students.

**The design of the study**
A significant limitation of observational data is that they tell you exactly what people did but not why they did it. The research design meant that I had a limited capacity to explore the perspectives of students on their own behaviour and their relationships with their teachers. I was too obviously a teacher, and a non-Indigenous one at that, for Indigenous students to comfortably discuss critical views they may have had of their teachers. This was not the case with teachers. During interviews, teachers were openly critical in their comments about the behaviour of students with current hearing loss. This was probably because they identified with me as a peer, and someone with whom it was safe to express their critical views. These views helped to inform the analysis of the ways in which conductive hearing loss can foster negative attitudes among the teachers of the many Indigenous students affected by conductive hearing loss.

It should also be noted that the quantitative analysis tool (chi square) utilised in the background noise studies can be unreliable if cells in the contingency table have low numbers. This is the case in some of the studies, even though the lack of verbal interaction of certain students at particular noise levels was what was important. The levels of significance have mainly been included for information. The analysis is predominantly based on an interpretation of the consistent patterns that were observed.

**Input from Indigenous perspectives**
The analysis was not informed by the perspectives of an Indigenous co-researcher (because of financial constraints and the limited number of Indigenous people working in urban schools) who might have provided
insight into the thoughts and feelings that lay behind each student’s observed classroom behaviours. Students also are likely to have been constrained when interviewed in making any critical comments about non-Indigenous teachers to me because I would have appeared to them as a non-Indigenous teacher. This means that consideration of the reasons for the student’s behaviour in the discussion is often speculative, as far as the student’s underlying point of view was concerned. In contrast, the information from the teacher interviews, in which teachers did not appear constrained in making critical comments about students, produced information that guided the analysis of teacher perspectives. Subsequent discussions with Indigenous parents and students since the study have helped to refine my understanding of particular aspects of the data and research results. This enabled more informed speculation about why students responded as they did during the study.

The absence of Indigenous education workers in urban schools and limited resources limited the scope for collaboration with other Indigenous adults. There is a danger too that because I come from a different culture and have experience as a teacher, I unconsciously filtered the data through a restricted set of codes. However, the opportunity to re-view data on videotape was a factor that made it possible to challenge the deployment of filtration codes.

The transcription and interpretation of data by a non-Indigenous adult researcher was also not ideal with research that aims to focus on an Indigenous child-centred interpretation of activity and events. However, when students and teachers are not aware of the factors (such as hearing loss and background noise) influencing the observed social responses, an unquestioning ‘emic’ approach to what is observed may obscure key relationships. The reliance on observational data limited some perspectives,
but also helped to focus the research on patterns of behaviour that were ‘out-of-awareness’ of the participants.

**Limited family information**
Another limitation of this study is that it did not examine the children’s home life in more detail. The Western Australian Aboriginal Child Health Survey (Zubrick et al., 2006) study has pointed out that children who experience many critical life events are likely to have poor social and emotional outcomes. There may have been events occurring in the target children’s home life that also contributed to the children’s responses at school. Children’s home life can have an important influence on their school behaviour, an influence that in my experience when working as a school psychologist is often exaggerated in the imagination of teachers. It is common for teachers faced with what they regard as unacceptable behaviour at school to wonder ‘what is happening at home’. A closer examination of the students’ family lives would have helped to ascertain whether, as is so often imagined by teachers, there were factors at play in each student’s home lives that contributed to their behavioural problems at school.

Alternatively, an examination of their home lives may have shown that:

1) children had fewer problems in the home environment, in which case it would be aspects of the school environment that were contributing to the behaviour problems at school; or

2) that some problems at home were linked to the stresses children with hearing loss experience at school.

Discussions with parents subsequent to the research suggest that it is common for some children with hearing loss or auditory processing problems to be exhausted or throw a tantrum soon after arriving home. For
some children with listening problems, the stress of coping with listening at school comes out at home. Some parents say that they often need to ‘debrief’ their children when they get home to help them clear away the hearing-related social and emotional difficulties that they face at school. An examination of the influence of home life on school behaviour and school life on home behaviour would have clarified these issues. This type of study still needs to be carried out.

The researcher was also unable to consider the implications of gender differences in the outcomes that can result from hearing loss. Stenton (2004) described these in a non-Indigenous population. She found more involvement in anti-social behaviour among males, and that females were less confident and more anxious. While these different behaviour patterns were evident among the students in this study, the number of students involved was too small to explore the possibility of gender based differences in the children’s behaviour.

**Limited hearing data**
The single measure of conductive hearing loss that was used did not provide any information on the amount of past hearing loss experienced by the students. The observed behaviour of students is almost certainly the product of both current hearing loss and the effects of past hearing loss on auditory processing skills. Extensive past hearing loss can inhibit the development of auditory processing skills (Hogan & Moore, 2003). A prospective study that identified the extent of the children’s hearing loss over a number of years could have provided a history of conductive hearing loss. However, such a prospective research design was beyond the scope of this research. It would also have introduced confounding factors, such as parents and teachers who became more aware of when children were affected by a loss of hearing loss,
and higher levels of medical intervention. Nevertheless, this limitation means the research design did not permit an assessment of the extent to which the observed classroom responses were associated with a current hearing loss or reflected a consistent response style for children who had experienced recurrent hearing loss.
SECTION FOUR
RESULTS

Chapter Eight
Individual case studies
Chapter Eight
Individual case studies

Introduction
This chapter presents two case studies. Each focuses on a single student with a current conductive hearing loss and provides an in-depth view of the behaviour of the student and their peers’ and teachers’ responses to that behaviour. The two students were selected because they were representative of other target students with a current hearing loss. One of them is male, the other female. One was in upper primary school, the other in an early childhood class. The differences and similarities in the responses and behaviour of the two students are described and discussed. Responses that are more evident at different noise levels are also described. This description serves as an introduction to the following chapter, which considers the interaction of background noise and hearing loss in greater depth.

Case Study One: Richard

Background
Richard is an Indigenous male who was in Grade Five. He had a mild hearing loss in the right ear and a moderate hearing loss in the left ear. Richard was very noticeable in his class. His constant calling out, antagonistic communication with peers and non-verbal antics frustrated his teacher, and disrupted and entertained his classmates. He would call out in class, but often remained silent when he was expected to participate. He completed little work in class himself and was highly dependent on his peers to complete what work he did undertake. He sought assistance from his peers in preference to assistance from his teacher.
School history

Richard had attended school in Alice Springs and in Darwin, and also an Indigenous community school outside Darwin. The information about Richard on file at his current school was limited, but a search of student files in the Northern Territory Department of Education’s (NTDE) central office found a past guidance report, coincidently prepared by myself, which described behaviour problems and social difficulties at another school that he had attended. At that time there was no knowledge of any hearing loss, if it existed at that time. The report stated:

After arrival at school Richard had difficulty in socialising with other students. He was not accepted by them and was teased about not having a skin group... In class Richard is constantly demanding of his teacher’s attention. He seeks to obtain this even through misbehaviour. This behaviour is disruptive of his and other students’ learning as well as being very frustrating for his teacher...

I observed Richard in the afternoon during a game of softball. He participated in the game co-operatively but kept up a regular shouting, commenting on what other players should do; these [instructions] were ignored by the other players and Richard did not seem to expect these to be attended to.

Richard appears to have low and probable negative self-esteem. This results in almost habitual attention seeking. Because of its constant and inappropriate nature the attention seeking is having the opposite effect to the one desired and needed by Richard; that is, positive social interactions...
Long term goals for Richard are to develop appropriate attention-getting strategies that will enable him to engage in social interactions which will validate his self-worth and lead to an enhanced self-esteem. Short term goals are to stop Richard’s inappropriate attention seeking which is self damaging and disruptive of the class (Guidance report, NTDE 24/2/89).

Richard arrived at the school where the study was undertaken at the beginning of 1990. His first semester report (June, 1990) placed him as working at ‘year level’ in all subjects, except written language, where he was placed in the ‘needs help sometimes’ category. Written comments by his teacher indicated that:

Formal aspects of punctuation and spelling need further attention...
needs to be encouraged to do as much oral reading as possible... he tends to be easily distracted and becomes unsettled and so his work suffers. (School Report, Richard June 1990).

However, his teacher’s comments indicated that he ‘... listens carefully, speaks fluently and confidently... has very good imaginative ideas... presents neat work... and enjoys participating and sharing knowledge’ (School Report, Richard June 1990).

Early in the first semester, a letter from the teacher and school principal was sent home to Richard’s parents to inform them of his ‘inappropriate behaviour’ on an excursion, and that he was to be banned from a forthcoming excursion.
Richard’s December 1990 report considered that he was working at the appropriate year level in all areas. Earlier problems in spelling and reading had improved somewhat. He was described as being more ‘settled and able to apply himself for extended periods of time’.

In June 1991 hearing tests indicated that he had a hearing loss. Richard had been attending the school for approximately eighteen months when his hearing was tested. Videotapes of his classroom behaviour were made at the same time.

It is not known whether Richard had experienced conductive hearing loss during his earlier schooling. This is quite possible given the patterns of ear disease in Indigenous populations. Richard’s teacher commented in his school report at this time that, ‘...considering the results of his hearing test, he has tried extremely hard to listen to instructions’. This report again placed him as ‘working at year level’ in most areas, with the exception of the areas of ‘listening attentively’ and ‘skills in the use of numbers’. For ‘physical education and health’ he was placed in the ‘sometimes working above year level category’. The teacher also added the written comment that, ‘...Richard quite often speaks out of turn, participates in group situations quite well... [at times] his behaviour is erratic’.

Later in 1991, on October 10, there was another note sent to Richard’s parents regarding a disagreement in which Richard was involved that ‘almost led to fighting’. This note informed them, that ‘...any future incidents of fighting will incur a suspension’. A second note, written by Richard, dated the same day, was also attached to his file. It is presumed that Richard was asked to write this after getting into trouble.
'The problem is we don’t mix together [together]. We sometimes are good friends [friends] when we cooperate [cooperate] in class. When I kicked the ball in his face by accident we said sorry to each other. That’s the problem'. (Letter written by Richard, October 10, 1991)

**Observational data based on videotape recordings**

Richard was one of the most noticeable students in class. Richard’s teacher, and others who had contact with him, described him as the classroom clown. He continually called out in class, either to the other students or in response to what the teacher had said. However, it was his non-verbal behaviour, not his verbal responses, which made him so noticeable in the class.

His non-verbal behaviour was dramatic and highly unusual. For example, he often acted as if he was playing charades. He danced, moved about the classroom as if playing football, and made faces in conjunction with odd noises. An example of this behaviour, drawn from my observational notes follows:

The teacher dismisses the class at the end of the day. Richard is first out of his seat and rushes toward the door. He has one arm tucked by his side as if carrying an imaginary football and his other arm stretched out in front as if warding off opponents on the football field.

Richard’s behaviour regularly drew the attention of other students and prompted disciplinary reactions from his teacher. A comparison of the teacher’s disciplinary comments during a one-hour period revealed that he was by far the most often disciplined: his behaviour drew teacher comment fifteen times, compared to twelve comments in total for all other students in class.
His teacher, however, did not describe him as the most troublesome student in her class. She said that while Richard often ‘called out and did silly things’, that she could gain some level of co-operation if she spoke to him on an individual basis. I observed her doing this on numerous occasions as a means of managing his disruptive public comments and ‘antics’.

It is possible, though, that both Richard and his teacher’s behaviour changed because of the fact that it was being recorded on video, since Richard’s teacher knew he was the subject of the video, and it is quite possible that Richard also worked this out. If so, it is probable that this would have had some inhibiting effect and that they may have normally have dealt differently with each other. On several occasions, when I was present in the class and Richard’s teacher was responding to his behaviour by discussing it with him, both Richard and the other students appeared perplexed, as if something different was happening compared to what would normally happen in response to this sort of behaviour. It was also noted that, on at least one occasion before videotaping began, Richard was sent to sit outside.

**Continuing social problems**

The videotape data indicated that Richard’s problems in relating to his peers matched those described in the earlier guidance report (NTDE, 24/2/89). These included interrupting others, misunderstanding other’s comments and other difficulties when participating in small group activities.

**Problems in small group participation**

Richard exhibited particular difficulties in situations where he had to interact with more than one person. If these situations occurred in class, he spoke little, and when he did speak his statements were often declarative comments. He responded minimally to the comments of others. On the
occasions that Richard did attempt to respond to others he often misunderstood what was said.

His reticence may have been to prevent others from becoming aware of his hearing-related communication difficulties. By not replying to the other students’ questions or comments and, instead, diverting the conversation by making a statement about something else, he might have been minimising the risk that his communicative difficulty might be discovered.

An example of Richard making sudden topic changes and misunderstanding others’ comment is evident in the following conversation.

Richard had been making comments to the whole grade about fishing. A group of students are sitting around their desks. There is a high level of background noise during this group work. A student comes up and asks Richard:

S: Where do you go fishing?
R: I like Whoppers [a type of hamburger sold by Hungry Jack’s]. Last night we had rugby training and we stopped at Hungry Jack’s on the way back.
S: You don’t train, you just muck around.
R: No, I like rugby better.
R: Leeton fights at rugby.

Richard changed the topic twice: ‘I like whoppers’ and ‘Leeton fights at rugby’, and his conversant was left to follow his lead. This conversational style, the instigation of regular topic changes through declarative comments and avoiding answering questions, minimised the possibility that Richard would be found to have not heard, or to have misunderstood what was said.
Richard also appeared to have difficulty in coping with overlapping conversations in small groups. He tended to focus on one person and ignore the others in the group. The following conversation, which took place during a break in group work, illustrates this point:

Several students, including Richard, Godfrey, Roger, and Rod are talking about a portable computer game. Rod is describing it. Richard is watching his face intently. As Godfrey starts to talk, Richard interrupts to ask Rod, ‘Is it good?’ Rod nods and turns back to talk. Richard interrupts again to ask ‘How big is the TV?’ Rod answers Richard’s question and continues to talk.

Rod finishes talking about a computer program and Roger starts to talk but is interrupted by Richard asking Rod, ‘Have you got it [i.e. the program/game]?’ Rod ignores the question and replies to what Roger has said, but as he does so Richard asks, ‘Have you got it, Rod?’ Rod interrupts what he is saying to reply to Richard.

Richard was observed to interrupt habitually, to demand that his questions be answered. He ignored the principle of taking turns when more than two people were conversing, and instead focused on one other person at a time. This may be because he relied on lip reading in noisy classroom situations.

This is supported by Richard’s own report on his coping strategies. When interviewed about his communication difficulties Richard said that he coped by lip-reading.

Interviewer: Are there any ways you have got of getting by when you can’t hear well?
Richard: I just look at the teacher’s lips.

However, lip-reading has some limitations when group social activity is involved. It requires an intent visual focus on one person at a time, which limits access to normal visual cues about other students’ intentions to participate in a conversation. People with good hearing, who do not need to lip-read, regularly sweep their visual focus around participants in a conversation to check for these cues. When there are overlapping conversations, lip-reading is not a strategy that helps someone to participate successfully in the conversation. The development of lip reading strategies also suggests Richard’s current hearing loss is not an isolated episode.

**Failure to scan other group participants**

The disadvantage at which Richard is placed in overlapping conversations can clearly be seen during observation of his visual focus patterns on the videotape. When watching Richard there is a sense that, while focusing intently on one person, he does not scan other group participants’ faces. Doing so would allow him to pick up the cues that others are about to speak. This is confirmed by a comparative count of the number of times Richard and another student within the group changed their visual focus. During the one-minute 38-second interaction, Richard changed his visual focus only seven times. In contrast, the other student changed visual focus 17 times.

Face watching is a strategy that helps to compensate for diminished auditory input in one-to-one conversations. However, for Richard, it is not a functional strategy when used in group situations where there is overlapping talk. It is notable that Richard’s teacher reported using one-to-one interaction with Richard to manage his disruptive activity when interacting with many
people. However, this meant that Richard often monopolised the teacher’s time.

**Uninvolved body orientation**

When sitting as part of a group Richard did not orientate his body to other group members or make regular eye contact. Likewise when sitting in class, he often looked down at what he was doing; making only occasional comments to the group, who generally looked up a lot more. As social groups formed and broke up in class, Richard was mostly on the fringes of the groups. The following was captured on videotape:

The students are engaged in group-work on the floor. They congregate around a book they are reading. Richard lounges on the outskirts of the group making sounds. The students ignore him and continue reading. After a few minutes he moves in to join the group, pushing one student aside. After finishing their discussion the group dissolves, and students move back to their workbooks at the tables. Richard remains behind as the group dissolves around him.

While his peers interacted with others during group activities, Richard often sat back in the group, drawing or playing with something as others conversed.

**Distractions**

However, while Richard participated less than others during group activities, when he did participate, he often disrupted the group task by distracting other students from it. For example:
Two students are reading a book on crocodiles — the topic of the project. Richard lies down on his side, shuts his eyes and begins to pretend to snore, filling his cheeks with air and blowing it out to produce a loud sound. The two other students look up to see if the teacher is watching and smile, but continue to work. After a few moments, Richard stops snoring and sits up. He pulls the class bin over to him, glances towards the teacher, and spits in it. The other two students look towards the teacher and exchange smiles with Richard. Richard pushes the bin away. The other two students go back to their work while Richard plays with a piece of paper.

This subtle disruption was typical of Richard’s classroom behaviour. Richard’s non-verbal antics entertained and distracted peers from group verbal tasks, in which he appeared to have difficulty participating. As he performed, he observed the whereabouts of the teacher closely and was acutely aware of the class rules. His was not naïve disruption, but calculated effort that may represent attempts to remain socially engaged despite his difficulties with participation in group activities.

**Calling out**

The most noticeable feature of Richard’s classroom behaviour was his calling out in class. His calling out was generally of two types: first, provocative comments to other students and, second, public comments on the teacher’s or other students’ public statements.

The first type of comment was one made to another student to cause a public dispute. These provocative comments often took the form of public accusations about another student and the breaking of some classroom rule. Other students observed these disputes, and in particular the members of a
small male peer group with whom Richard socialised. Most often it was
students who did not belong to this group who were the victims of Richard’s
provocations, and the members of his group provided an ‘appreciative’
audience for Richard’s teasing. For example:

Michael gets up and sits on the teacher’s chair, a chair that he had
already moved. Richard calls out to him, ‘Michael get off that you
dork’. Michael replies ‘I’m allowed to move it’. Richard: ‘No, you’re not.’ Michael: ‘Yes, I am’. Michael gets off the chair and moves it
further away. The researcher is passing by the group. Richard calls
out, ‘Mr Howard has to use it.’

Richard was often observed to embellish incidents so as to create a more
dramatic event, and potentially greater trouble for his victim.

Brian leans over to the microphone on their desk [there for research
purposes and next to Richard] and says, ‘Hello, Mr Howard’. Richard
in a loud exaggerated voice calls out. ‘Ooh um Brian said Mr P. [the
school principal] is an idiot’. The student replies ‘No I didn’t’. Richard
says ‘Yes you did and it’s on that tape so everyone will know.’

Some other incidents observed in class illustrate Richard’s style of
provocative calling-out.

• He called out ‘dog’ to another student who was being
disciplined by the teacher. ‘Dog’ is an extreme insult.
• After calling out in class he called out ‘Brian’ as if to blame him
  for his own behaviour.
• After spending time drawing defamatory pictures of another
  student, he called out to his friend that it was ‘his’ picture —
meaning his friend would get into trouble for drawing it if it were found. This interaction was voiced quietly, and was thus a ‘private’ rather than a public statement designed to embarrass one of his peers.

As stated earlier, Richard did not participate, or often participated in only a limited way, in small group activity. This seems related to the difficulties that he had hearing in this situation. On the other hand, he participated more, although inappropriately, in public classroom interactions. This may have been because they took place at a higher decibel level. Since Richard would be able to hear these more easily, there was less likelihood of an embarrassing communicative breakdown. It would seem that Richard only participated in the classroom conversations that he could most easily hear.

In the next vignette, Richard attunes himself, and then responds to conversation in class that takes place at a high decibel level.

Richard is sitting with a work group but participating minimally in the group. A student somewhere else in the class can be heard calling out loudly to the teacher ‘Miss …., Miss S…..’. Richard looks across – his attention drawn by this interaction. Richard calls out ‘nat, nat, nat’ loudly. Other students ignore him and continue to search through the book they are reading. They argue about which way to do this, and one student’s voice can be heard raised over the others saying, ‘This way, this way’. Immediately afterwards, Richard mimics, ‘This way, this way’. A student’s voice can be heard somewhere in the class saying ‘I can’t find it’. Richard ‘replies’, with an intonation of exasperation, ‘Well, go and find it’.
In the above incident, Richard responded to a loud conversation across the room, while ignoring the quiet group conversation close at hand, which he appeared to have difficulty participating in. It would appear that the only classroom conversations that were at a high enough decibel level for him to easily hear were the public conversations of the teacher or other pupils. His ‘calling out’, as his teacher described it, is a constant commentary, or reply, to the loud public conversations that took place within the classroom.

While these interjections were unwelcome to the others in the group and the teacher chastised him for them, they may represent for Richard a ‘safe’ form of socialising in class. ‘Safe’ because the comments were at a loud enough level for Richard to reply with assurance that he had heard accurately. On the other hand, small group conversations were fraught with the danger of communicative breakdown when he did not understand what had been said. It is situations such as these that could lead to the possible discovery of his communication problem.

The ‘calling out’ was cited by his teacher, before hearing tests were carried out, as a reason for believing that Richard did not have a hearing problem. But it now seems clear that Richard’s calling out in class, together with his minimal participation in quiet small-group conversations, was related to communication problems that he encountered because of his hearing loss. ‘Calling out’ appears to be a coping strategy that he used to remain involved in verbal conversation in class, despite the difficulties created by his hearing loss.

However, there appeared to be some occasions when Richard did not exhibit his typical provocative teasing and calling out. The school librarian described him as being no problem in her class.
Normally he sits on the periphery of groups with very interesting picture books and he can just sit and spend a lot of time on that without any interruption from us. He always sits on the physical periphery of the group, but is no problem. (Librarian)

It is interesting to consider why Richard’s behaviour may be different in this context. The library is noticeably quieter than Richard’s classroom. Richard’s teacher tends to talk over the level of background noise rather than demand quiet before speaking, as was the practice of the librarian. Another possibility may lie in the librarian’s comment ‘without any interruption from us’. Richard is allowed to read a book on the periphery of the group with minimal demands on him to perform, and possibly fail.

In 1994, I described a style of classroom interaction evident between some teachers and children with hearing related learning and behavioural problems (Howard, 1994). I described it as ‘mutual disengagement’, whereby the teacher allowed students to engage in busy work - often looking through books and magazines - as long as they were in no way disruptive of the lesson for the rest of the students. We can only speculate as to what aspects of the library environment may be important in minimising Richard’s otherwise typical disruption. However, the fact that his behaviour is environmentally specific suggests that his behaviour is related, at least in part, to environmental factors and not solely intrinsic personality factors. His interruptions appear purposeful, perhaps related to what he sees as the best strategy if he is to avoid the public failure that he is vulnerable to when he has to listen in noisy environments.
Antagonistic socialising

There were other features of Richard’s social interaction that helped him to avoid social isolation, but consisted of what is considered socially undesirable behaviour. One of these is his often-antagonistic social relations with others. These are apparent in the vignettes presented above. Richard was often seen to purposely instigate negative social interactions with his peers. The following is another example of this behaviour.

Richard has just failed to participate in a group project. Another group comes into close proximity and Richard calls out to them on behalf of his group. A student comes over towards the first group and starts to move a chair away to clear an area to sit down in. Richard calls out to them, ‘go and work somewhere else, go up there and do it’. The students ignore Richard and settle down near his group. The students go back to work. One student in the second group can be heard talking about crocodiles. Richard calls out, ‘We’re doing crocodiles, you do something else’.

A feature of Richard’s antagonistic socialising was his regular abuse of other students. He frequently called them dumb or stupid. This may reflect concerns about being seen as dumb or stupid himself. In my experience of working with children as a psychologist, children who habitually describe same-age peers as having particular negative attributes often have defensive concerns that they may themselves possess this attribute. Richard also took pains to avoid situations where he could be observed to fail. For example, often chose not to answer the teacher’s questions, or to accept the help she offered when other students were around. This sensitivity to being shamed shaped the way he involved himself in learning.
**Involvement in learning**

As has already been noted, Richard often spent little classroom time involved in the tasks that were actually set. He spent a lot of time moving between group activities on the floor and individual activities at desks, and wandering the room. As he did so, he often disturbed other students, or occupied himself with the non-academic aspects of set work, for example drawing a picture for a project while the written component of the activity was never finished. The following vignettes illustrate this point.

After students return to their seats, Richard wanders the classroom for an extended period of time; looking at what people are doing in the computer area, playing with art work that has been left to dry. Finally, when his teacher tells him to get to work he crawls back to his table on his hands and knees. He often returns to his table this way after work on the floor. He finally takes out his books, by which point a third of the time allowed for the task has already elapsed.

Richard is sitting at his desk, drawing. The teacher comes to look at his work and asks him why he is not writing, as he is supposed to be. He replies that he is going to write about the assigned topic after he draws a picture about it.

Richard was very adept at avoiding work. Often it seemed as if he did not know how to do the work that was expected, but would not admit this to his teacher. When his teacher asked if he needed help to undertake a specific piece of work, Richard would reply that he knew how to do it, even when he did not. For example:
Richard is slow starting his work. His teacher calls him over and asks him if he knows what to do. He replies immediately that he does, but that someone else is using the necessary book. The teacher finds out which student has it and asks them to give it to Richard when they are finished. Richard goes over to them and takes the book, saying Miss S. said he could have it. He returns to his table and flicks through the book for a time. His best friend Godfrey passes his table and Richard calls to him, asking him what they have to do. Godfrey explains the task and Richard commences work. Richard goes and seeks Godfrey’s assistance twice more before the lesson finishes. When the lesson is finished Richard has not finished the task.

This is a typical interaction. Richard denied any inability to do the work that was set and engaged in elaborate excuses, which took a lot of teacher-time to resolve. However, Richard often did need help, and he sought it from his peers, usually his best friend Godfrey. It would seem that much of Richard’s efforts in class were designed to disguise his communicative difficulties, at the expense of his engagement in learning.

Richard’s public socialising also affected his work. During one 21 minute period, aside from the time that the teacher had spent working with him, Richard had been on task for less than two minutes in total. In summary, Richard:

- completed little work;
- sought to avoid the possibility that the teacher or other students might notice that he was having difficulty;
- was reluctant to accept assistance with his work from his teacher;
- sought assistance from male peers with his work; and
• presented elaborate and time-consuming excuses as to why he had not and could not complete tasks as expected.

Although Richard was reported to be working at the appropriate year-level in most subjects, the observational data indicated that he was engaged in very little learning during the observation period. It may be that his responses were related to a temporary period of conductive hearing loss. Alternatively, it may be that Richard had successfully convinced the teacher that he was able to work at year level, although actually completing little work. However, the observational data suggest that hearing loss was adversely affecting Richard’s learning at the time he was being observed for this study.

**Richard's own perspective on his hearing loss**

Richard was interviewed on one of the occasions that he was sent outside as a way of managing his classroom behaviour, before his hearing test results were known. When asked why he had been sent outside his reply was that, ‘When the teacher gave instructions I couldn’t hear and I done the wrong thing and got into trouble’.

Despite this, he later denied having any problems in class because of his hearing loss, which by that time had been identified. When asked what difficulties he had at school because of his hearing loss, Richard said that sports and play times were the most difficult. He said his difficulty at these times was related to the high levels of background noise because of other students ‘screaming’. For example:

Richard: When I’m on the slippery slide and while I’m playing rugby sometimes.

Interviewer: Why is that?
Richard: Screaming.

Interviewer: Other kids screaming?
Richard: Yeah, like when you are playing gang up I can’t hear properly.

Interviewer: How do you play ’gang up’?
Richard: Once a person gets tipped you have got to stay with them.

Sports (especially rugby) were Richard’s favourite activity at school. Richard was recognised within the school as a highly successful member of a rugby team. It is interesting to note, once again, that on occasions Richard was seen to bring a football into the classroom, and to ‘act out’ varying elements of the rugby game. As has already been noted, on other occasions he would rush out of the classroom at break time with an imaginary rugby ball under his arm, or tackle an imaginary opponent on the classroom floor.

Some of Richard’s ‘in-class’ disruptive behaviour may have been an attempt by him to ‘bring into’ the classroom an activity that was, for him, a high status activity outside the classroom. When he was asked about the thing that most bothered him about his hearing loss Richard’s reply related to rugby, and especially his difficulties in hearing his team mates on the field.

**Amplification**

The audiologist’s report (24/7/93) stated:

As a result of learning levels, his [Richard’s] awareness of his own hearing difficulties in the classroom and his keenness to hear better, it was decided to fit him with a bone conductor type hearing aid immediately. He approached the fitting with enthusiasm and maturity;
with support and understanding he should cope well and benefit from the use of amplification.

Richard wore the hearing aid willingly at first, but became increasingly reluctant to wear it after a couple of weeks. It then became a matter of his teacher reminding him to put it on while he practised the same avoidance tactics that he employed so successfully in avoiding schoolwork. Eventually he no longer wore the hearing aid at all.

When he was asked what wearing the hearing aid was like his reply identified problems with the bone conductor.

Richard: When the other kids are talking and the teacher is talking it’s hard, it’s mixed up.

Bone conductors amplify all sounds in the environment so in noisy environments they may be of limited use, as seems to have been the case for Richard.

**Discussion**

Richard exhibited a range of communication and social problems that appeared related to his current hearing loss and probable past hearing loss. He coped better in one-to-one conversations where he used lip reading as a visual compensation strategy. His teacher commented that, alone in a one-to-one setting he was good, but in a group situation he could be difficult. This appears to be a function of his visual coping strategies. They were not effective when there were overlapping conversations and background noise. At these times:

- he failed to visually monitor other students when conversing with more than one other student, so he did not notice the non-
verbal participation cues that indicate when others wish to speak;
• he interrupted group conversations inappropriately and focused on only one person at time in group situations;
• he appeared to avoid verbal participation in small class groups and appeared to operate on the periphery of groups;
• when he did participate in verbal interaction in class he was prone to misunderstand what was said to him;
• he made unilateral topic changes and often did not respond to others’ comments, or their responses to his comments; and
• his group social responses were often disruptive and antagonistic, but perhaps attempts to remain socially engaged in spite of the communicative difficulties related to his hearing loss - for example, his calling out in response to the classroom conversations he could hear most easily, although this was viewed as disruptive behaviour by his teacher and peers.

While group social participation appeared difficult for Richard, the one-to-one contact Richard had with his teacher and with his closest friend Godfrey was more positive. His success in communicating privately with his teacher won him greater tolerance from the teacher in relation to his public misbehaviour. His relationship with Godfrey was one that allowed him to expose his difficulties and seek help.

Richard’s greater success with one-to-one conversation, compared with his difficulties when dealing with conversation in group settings, may be related to the greater efficacy of his face watching in one-to-one communication. Preference for one-to-one over group verbal interaction is a commonly expressed preference for adults who are hard-of-hearing (Stika, 2000).
Richard’s comparative success in one-to-one situations may help to explain my finding, when working with Indigenous students in two remote schools, that the students with conductive hearing loss needed more one-to-one help than the other Indigenous students (Howard, 2004). If Richard’s experience were found to be typical of the experience of other Indigenous students with conductive hearing loss, this would help to explain why it is difficult for many Indigenous students to benefit fully from schooling. It would also indicate that greater access to one-on-one help may be necessary if educational outcomes are to be improved for many of the Indigenous students with conductive hearing loss. However, Richard’s reluctance to accept help from his teacher may mean that even if more help were available, he might not make use of it. In recent research I found that Indigenous apprentices with listening difficulties reported efforts to avoid seeking help from teachers at school, so they would not be shamed in front of their peers (Howard, 2005).

Richard’s very noticeable calling out in class appears to be a means of participating in conversation when he was sure that he had understood what was said and was not vulnerable to the kind of misunderstandings that he experienced in other types of classroom discourse. In these other contexts, Richard appeared to experience difficulties that are attributable to his hearing loss, multiple speakers and background noise. His calling out in class appeared to offer Richard a communicatively safe form of social participation, but it was one that was socially unacceptable.

It is interesting to note that Stehbens et al. (1999), when writing about school exclusions among Indigenous students found that calling out was a behaviour that contributed to the exclusion of many Indigenous children. Indigenous students who had been excluded from school commented that
their difficulties in understanding teaching instructions initiated a sequence of events that ended in school exclusion. Richard’s perspective, on one occasion when he was sent out of the class, was that the level of background noise (‘kids screaming’) made it difficult for him to hear the teacher. A connection between calling out in class, to such a degree that this behaviour is seen as a problem, and hearing loss is not intuitively obvious.

Richard often teased others. Others viewed this teasing as disruptive and antagonistic behaviour. Teasing establishes a degree of social connection but imposes few listening demands on the perpetrator, and it is this that may have made teasing attractive to Richard, because it allowed him to avoid the risk of communicative failure that, for him, was inherent in reciprocal verbal interaction. However, Richard’s teacher viewed the teasing as ‘attention seeking’.

While Richard’s constant verbal and physical harassment of his peers did amount to social connection of a sort, it did not foster positive social relationships with most of the others in the class. Also, while his highly distinctive classroom behaviour was successful in that it served to maintain some degree of social connection for Richard, it also served to isolate him from others and did not help him to engage in learning tasks. However, his various behaviours effectively distracted the attention of Richard’s peers and teacher, so they did not become aware of his hearing-related communicative and learning difficulties. Richard displayed some skill in the way he diverted attention away from these problems by using teasing and other disruptive behaviour. I found associations between the incidence of hearing loss among Indigenous children, their involvement in teasing and their difficulties when participating in teacher directed verbal discourse (Howard, 2004).
Case Study Two: Renee

Background
Renee was an Indigenous student in ‘Transition’ (the first year of primary school). She had bilateral moderate conductive hearing loss. As she was at an earlier stage of her schooling there was far less information on her school file than was the case for Richard. Renee was the third of three daughters of a single mother. The family originally came from Queensland. Renee had trouble fitting in the classroom: she had difficulties socialising with peers and was often disruptive in class. She was frequently absent. Her family had not been aware of her hearing loss, until the hearing tests were carried out at school. Her mother suggested that the family had not noticed because: ‘It’s so noisy at home you hardly notice with the TV and the fighting. It’s good her teacher noticed in class.’

Difficulties with phonics and social problems
Renee’s teacher reported that while Renee had difficulties with phonics, it was her social behaviour that was of most concern. Renee’s teacher felt that her frequent absences and disruptive behaviour were compromising her learning.

Teacher: Her hearing loss does affect her with phonics, very badly. She can’t hear the difference between a few [of the] sounds, and when she speaks I’m not sure if she is telling me the right thing or not. I have to get her to repeat things over and over, which must be really infuriating. She copes with it really well in that she sits at the front at my knee and she knows what’s going on very well. But there are other things that happen in class that most concern me... how she is with the other student[s]. She hurts them. They are very good actually. None of
them turn around and belt her back, which I’m a bit surprised [about]. But they come to me and she has really hurt some of them very badly. But work wise, I think, she is really bright, she catches onto things really quickly, and she remembers things. I’ve got my kids ability grouped more or less, and unfortunately she’s is the lowest one but she shouldn’t be, she [is] in a way the best of the lower ones, but I’ve had to put her there because she is away so much of the time, either at home or with Helen [ESL Teacher]. Also she misses out on so much because of her behaviour. That was the smallest group and I felt it would be least hassle for her.

The following transcript of Renee’s participation in a small group illustrates the difficulties that she had in learning in a group. During this group activity she interjected inappropriately, grabbed objects that were being used in the lesson, and refused to give them back to the teacher. Her behaviour disrupted the hands-on activity the teacher was trying to involve the group in. Here are a series of examples:

Students move to the next table. Renee is the first student to get there. There are trays of money on the table and Renee immediately grabs two. The teacher sits down and says, ‘Hang on now’, takes the trays from Renee and tips the contents of the two into one big tray. Renee takes a third tray and tips it in before the teacher can. Renee then picks up the money and runs it through her hands. She then picks up a card on the table and fans herself with it. The other students are looking at their cards.

The teacher and students are seated at the table. The teacher collects the cards from the other students, but when she comes to Renee,
Renee holds it back. The teacher says ‘Thank you’. Renee holds it towards her then pulls it back. The teacher says ‘Renee, we’ll get on to that’, and Renee finally gives the card to the teacher, who packs it away.

Students are sitting around a table talking to the teacher while Renee sits on the other side of the table waving her hand. She is the odd one out. The other students lean close as they listen to the teacher, but Renee sits back waving her hands. Renee, looking at a coin, says ‘That’s got a big picture on it’. The teacher asks ‘Do you know what animal that is?’ and talks to the students about what the animal is. Renee picks up a coin and drops it on the table. It bounces. The teacher comments, ‘We’re not going to find out when people are throwing it around’ while looking at Renee. Renee continues to play with the money. The teacher tells Renee. ‘Hold onto that money’. Renee holds onto the money.

In this small group, Renee has difficulty understanding verbal instructions. She ignores implicit directions, and needs explicit directions before she responds. The teacher is spending time on managing Renee; time that is diverted from the lesson. On several occasions the teacher has to intervene to stop her playing with objects. As the lesson continues, Renee shows she also misses the point of what is going on.

Teacher continues, saying, ‘A picture of a lyre bird. What else is there a picture of?’ Renee puts up her hand and makes a comment ‘The other one has a lizard’ which does not answer the question. The teacher replies ‘Well that’s no good’. The teacher then attempts to redirect her to the original question by asking what else she could see
there. Renee stares at the coin while the other students engage in conversation with the teacher. All of the other students are physically oriented towards the teacher and are sitting close, while Renee sits further back, physically isolated from the group. She rocks her head back and forth.

Renee continues to play with the coin. She takes another coin and the teacher says ‘No, give it back please.’ Renee doesn’t. The teacher then ignores her and continues the lesson with the other students while allowing Renee to play with the coin. Renee leans across the table to grab a piece of paper and the teacher asks her to sit back and to get something from another table. Renee goes to get it. The teacher continues to talk to the other students about the picture. Renee comes back to the table and comes close to the teacher with the coin held out to show her.

The teacher takes it out of her hand while continuing to engage the other students in conversation. Renee sits back on her table. She picks up another coin that was on the floor, and comes back and puts it in the container trying to be helpful, as she has been earlier on.

Renee had difficulty participating in this highly verbal lesson. Her non-participation in the bulk of the lesson’s activity appeared due to her difficulties with the verbal content. She also sought out other tasks to try and be helpful, for example, picking up coins and returning them to the tray.

It would appear that Renee was ‘under-challenged’ because she was unable to participate in this highly verbal activity. As the lesson continued she misbehaved, was disciplined, and responded by ‘sulking’.
Other students watch and talk to the teacher as they look closely at the coins. Renee rocks back and forth on her chair. The teacher leans in close and shows them the number on the coin, shows them the number five up on the board, and then talks to them about the number five on the coin. She shows this to Renee.

She holds up another coin, shows the students the number two, and shows it to Renee as well. Renee leans forward and says 'That’s a goanna'. Renee reaches out, grabs more coins, and the teacher says 'I’ll let you have a go in a minute'. Renee ignores her and the teacher says 'Renee...' in a warning tone. Renee gives the coin back, sits on the table again, leans forward, and kicks her legs. Although she’s in close proximity to the teacher, she moves around. Renee gives the student next to her a shove, pushing his head to get it out of the way. Renee fidgets at the table. The teacher gives instructions for the task, which is to take a picture of the money and to match it with a coin. Renee grabs one of the cards that the teacher is showing. The teacher says, 'Renee, give it back'. Renee does. The teacher adds it to her pile, and then continues to give instructions. The teacher says, 'Sit at your place' to the whole class.

Students sit back at their places. Renee sits with exaggerated straightness, and is handed a card. She pushes it around in front of her, and leaves the table for a short while. The teacher says, 'You two share that'. The teacher puts a tray in front of Renee and her partner. Renee grabs it, and pulls it over to her side. The teacher looks up and says 'Renee!' with an exasperated look on her face, then says something indistinct about sharing the tray with Byron, the student next to Renee. Renee sits down with the card she has in her hand. Byron starts to pick
up the coins and plays with them. The teacher continues to spread money out in the trays.

Renee looks down and pouts. She looks as though she is sulking because the teacher spoke to her with exasperation in her voice. The other students have all started work, but Renee continues to play with her card. The teacher looks up and Renee pouts. The teacher looks across at Renee and says, ‘Oh you look, very sad’, in response to her pout. She picks up one of Renee’s coins and holds it out to show her.

Renee ignores her. Renee, alone among the students, has not yet started work. She reaches over and touches Byron’s coins and cards. The teacher says ‘I think Byron can do it’, and hands some coins and cards over to Renee. Renee starts to move the coins on the card. The teacher looks at her watch, comes close to Renee and says, ‘Renee, it’s time to go and get the lunches now. Put your cards and coins back in the middle.’ Renee picks up her coins, throws them and the last card in the middle, and walks off.

While Renee was collecting the lunches the teacher conducted a lesson without the distractions created by Renee.

This example illustrates a number of features of Renee’s participation in class:

- she had difficulty in participating in lessons that relied on ‘teacher talk’;
- she was eager to undertake tasks within her capacity, as demonstrated by her willingness to undertake the two tasks that she could understand;
• her behaviour was very demanding of teacher time and diverted the course of the lesson;
• her disruptive behaviour centred on the physical objects designed to be used in the lesson;
• she was emotionally sensitive and sulked when chastised, despite having done a number of provocative things; and

There was a clear relationship between Renee’s difficulties in participating in the highly verbal lesson and her provocations, which were attempts to engage the teacher’s attention by grabbing objects. Renee’s socialising with peers was also typified by provocation of others in an attempt to regain objects she had inappropriately taken. In effect, she often ‘socialised through objects’.

**Socialising through objects**

As illustrated above, Renee was frequently observed to instigate social contact by taking materials from other students, or monopolising objects. This most commonly happened when the background noise level was high.

When the students are using geo boards, boards with nails at regular intervals so the students can wind rubber bands around them to make different shapes, Renee takes some rubber bands from the student next to her. She already has a pile of rubber bands on her desk. The student makes as if she’s going to hit Renee, but doesn’t. Renee keeps the rubber bands. Later in the lesson Renee is chastised for monopolising rubber bands. She achieved social contact with the teacher and students through her ‘teasing’ behaviour.
Renee has all the rubber bands in a container next to her. The students at the next table ask her to share but she refuses. The teacher comes by and asks Renee to share. Renee responds by calling out loudly ‘Hey’ and throws some rubber bands that the student next to her had put on her table.

Later, Renee again puts all the rubber bands in her container and shows them to the student next to her and says, ‘I’ve got yours in there’.

Renee is observed on other occasions to similarly attempt to monopolise objects used during games. Hands-on projects at separate tables are a regular activity in her Transition classroom. Small groups of students rotate around the tables. When one activity was finished, Renee regularly rushed on to the next table and grabbed the objects to be used there, so that she became the one who dispensed objects to other group members. This often led to complaints from other students that Renee was ‘not sharing’.

Socialising through objects is a form of interaction with peers that places minimal reliance on verbal communication. The object becomes the subject, so there is minimal ambiguity about the topic of communication. However, as noted in the first case study, while this strategy serves to avoid social isolation, it tends to annoy and alienate peers, and often leads to peer antagonism and rejection in the longer term.

**Verbal communication**

Difficulties with verbal communication were typical for Renee. The following transcript highlights these difficulties. The teacher is talking to Renee about her participation in a program carried out by a visiting teacher:
Teacher: Do you think you can tell me what you’ve been doing? Could you, cause I’m not in your group. [Renee’s group has been undertaking language activity in class].
Renee: I was playing with my puppy [Answer unrelated to question].
Teacher: Pardon?
Renee: I was playing with my dog.
Teacher: Spanking your dog?
Renee: No, I was playing with her.
Teacher: Playing with your dog inside?
Renee: No, outside.
Teacher: Oh, I thought you were inside working — were you? What were you doing? [Long pause.] Oh you’re in Miss R.’s group, aren’t you? What are you doing in Miss R.’s group? Tell me about that.
Renee: We colouring in.
Teacher: Colouring in! What are you colouring in?
Renee: In, in the houses.
Teacher: Houses! Are you going around colouring in houses?
Renee: Little ones.

Both Renee and her teacher seem confused about the topic of the conversation, and the teacher seems to be struggling to follow the meaning of Renee’s comments.

Renee was observed to participate less than other students in verbal communication. When she did participate, it was often when the classroom was quiet. For example:

Renee leans across and talks to a peer. This is the first occasion that Renee has participated in verbal interaction in class during this period, when other students in her group are actively conversing. It is
immediately after the teacher has quietened the other students, and
when most other groups are working at a quiet level. Background noise
is at a minimum and the comfortable playfulness of the interaction is in
striking contrast to Renee’s attempts to socialise through objects when
the classroom is noisy.

Another notable feature of Renee’s usual verbal communication was that she
made statements, or told people to do things but rarely responded to others’
comments. Her hearing loss would make it difficult for her to understand,
and so respond to, what others had said. An example of such a declarative
statement is as follows:

Renee turns to the student on her left, and calls out for a second time,
‘Look, look at this’. Later, while the class is packing up and there is a
high level of background noise, the student next to Renee asks her
something, but Renee does not reply.

Finally, Renee had a habit of telling tales. Her teacher reported that other
students complained about Renee telling on them. Her tale telling on
students was also evident on videotape, as in the following incidents.

A boy next to Renee had broken his pencil when playing with it. Renee
calls out, ‘No I’m telling on you’. The teacher comes over. Renee says,
‘Dan broke this pencil.’

The students are sitting in line. They have been instructed to get a
drink. Renee sits quietly after having had her drink, staring, not seeking
to communicate with anyone. The other students are talking to each
other. Several students have walked past her. She calls out, ‘Here’ and
motions them to sit near. They ignore her. She then tells on a student
who has not gone to get a drink.
The distinctive features of Renee’s verbal communication were:

- her difficulties with receptive communication, especially in noisy environments;
- her lower degree of involvement in verbal communication when compared with the other students;
- her verbal communication style was predominantly declarative and based on directive statements such as ‘Look at this’, ‘Sit here’; and
- she often threatened to ‘tell on’ peers or actually did so, for not doing what was expected by the teacher.

This pattern of verbal communication had consequences for Renee’s interaction with other students. She often told tales or issued commands to her peers. She made statements, but often did not respond to others’ comments. There were few reciprocal verbal interactions that built social relationships. Her socialising through objects, which irritated her peers, also failed to produce positive social relationships.

**Social relationships**

Renee had major social difficulties, as described above. Of particular concern for her teacher was her use of physical contact with other students to instigate social contact. Her teacher ascribed this to ‘bad temper’: ‘She is very bad tempered, none of the other children like her, they won’t partner her, they won’t sit with her, and she pinches them really badly, she hurts them’.

The librarian supported this assessment:

Librarian: Her behaviour was always beyond what we expected of her. She played up a lot.

Interviewer: How is she going socially with the other kids in ESL?
Librarian: She’s fine because she knows I watch her. She will be nasty at times.

She was not observed to pinch others on videotape. However, pinching is an escalation of the provocative behaviour that was observed. If her taking of things was ignored by Renee’s target, as it was at times by her teacher, then Renee would sometimes ‘pinch’ students in an escalation of her usual methods of attention-seeking. However, as with the taking of objects, pinching engages others socially but is likely to lead to antagonism, social rejection and retaliation. It may be, however, that pinching others is a result of her frustration over her other social difficulties.

Her teacher commented that her threats of, or actual tale-telling also made her unpopular with her peers. Overall, her social difficulties appeared to be related to her hearing loss, but might also have been influenced by her family position as a youngest child with doting older sisters. Her mother reported:

We all spoiled her when she was born you know. Because I had A and L (sisters) so close together so I made sure I had a break for six and a half years before I had Renee and of course the girls said, ‘We want a girl, we don’t want a baby boy’, and their wishes came true and they spoiled her, so she’s real special. (Mother)

Although Renee was a very much wanted child, Renee’s mother indicated that her sisters, especially the one who helped get her ready to go to school, also had difficulty with her.

A’s the one who gets her ready for school in the mornings. This morning Renee was awake and A was saying, ‘Get up’ but Renee was
saying, ‘No, my eyes won’t open’. She would stay in bed for another five minutes. Then A gets her lunch ready, and then it’s a mad rush. Renee takes her time, and A’s in a hurry because she’s got to walk to school and it takes about ten minutes and that’s when the arguments start. I’ve got to take it up with Renee all the time. I’ve seen some arguments and A has smacked her a couple of times, but that’s between sisters and I don’t take any notice of that. When she is in a good mood she wants to come to school. (Mother)

Her mother, like her teacher, also mentioned that Renee’s moods were important in her response to others. Her emotional variability may be related to her hearing-related social problems. Renee appeared focused on her immediate wants, and was unaware of, or unable to resist these, notwithstanding the expectations that others had of her. Evidence for this was provided by her lack of co-operation with her sister and her non-compliant behaviour with her teacher. It may be that her hearing difficulties limited her understanding of the expressed desires of others and created problems for her when she sought to meet her needs.

Her lack of co-operation at home extended beyond her behaviour with her sister, into other areas of the home. Indigenous families expect children to take on significant and responsible roles around the home (Malin, 1989). For example, the responsibility for helping Renee to get ready for school fell to an older sister. However, Renee’s mother reported that Renee herself did not help around the home. Given the cultural expectation that a child will help at home, Renee’s failure to take on this type of responsibility suggests a social immaturity at home, as well as at school.
She wants to get out of all kinds of housework, you know, the baby. It’s up to her sisters to do all the work. Well I don’t expect Renee to do any work, well maybe tidy, put her shoes away, and school bag. That’s all. (Mother)

Another indicator of her social immaturity was Renee’s preference for playing with younger children. Her mother reported that outside school she usually played with younger children, especially a three-year-old neighbour. It is not surprising, given her behaviour, that Renee found it difficult to establish friendships and in fact was described by her teacher as having no friends in class.

No, I’ve tried to get someone, you know, ‘You be Renee’s special friend and line up with her,’ to encourage her to line up, because she won’t line up at all. It worked for about two days then the girl wouldn’t have anything to do with her after that. (Teacher)

Peer rejection
Renee’s peers were seen to reject her attempts to instigate social interaction.

Renee taps an Indigenous boy in front of her and smiles. He doesn’t respond. She then turns to the boy behind her and moves as if to tickle him in the ear. She doesn’t actually touch him. He jerks to the side and then makes a similar movement towards her. Renee turns to the girl sitting next to her and touches her cheek. The girl tells her, ‘Don’t’ and wipes her cheek. Renee then nods her head wildly, touching her cheek, and then briefly looks to Rachel who ignores her and avoids eye contact.
Despite Renee’s apparent preoccupation with social inclusion, the tactics she uses to achieve it are often not successful. In fact, her attempts to socially engage other students are dysfunctional in that they more often result in social rejection.

**Telling tales**

Another feature of Renee’s interaction with other students, and one that is associated with their rejection of her, was her habit of ‘telling on’ other students. Successful telling of tales about others’ behaviour depends on an accurate knowledge of classroom rules and routines, as well as an awareness of others’ activities. Some students with hearing loss tend to be well aware of classroom rules and routines, possibly as a compensating strategy for their inability to effectively follow the teachers’ verbal instructions.

It would seem that Renee’s knowledge of classroom routines was expressed socially by ‘telling on others’. Rather than purposeful antagonism, this behaviour may represent the use of class rules as an exchange mechanism that can be used for social interaction, by ‘telling on others’. However, this does presuppose an awareness of others’ activities that can only be acquired through frequent visual scanning of the classroom. Renee, like the other target students in this study, was often observed visually scanning the classroom.

**Visual scanning and distractibility**

Visual learning strategies are more commonly used by Indigenous students (Harris, 1980). However, Renee used visual scanning noticeably more often while in class than the other Indigenous students. She was also more readily distracted from her work by other students, and less so by extraneous events, as the following vignette indicates.
Two students from another class come in through the door. Other students watch, but they glance up whilst continuing their activity. Renee turns right round in her chair to be able to see. The visiting students come in to help some students in Renee’s class, and they sit down at a board next to her table. When one makes eye contact with her she moves as if to hit him but doesn’t follow through.

Visual scanning can be used effectively to learn what to do, by observing others. It is thus one of the peer learning skills that can be effective in helping students to know what they should be doing when they have diminished auditory input. However, too great a focus on others can lead to attempts to direct others, or to tale telling. These aspects of a visual scanning coping strategy usually have negative social consequences.

**Discussion**

Renee’s teacher was very concerned about her social behaviour, with good reason. Renee was socially immature and had significant interpersonal difficulties. Her social immaturity appeared related to limited knowledge about appropriate ways to get her own needs met, and a lack of focus on others’ needs. This may be, in part, because she is a ‘youngest child’. However, her hearing loss also appeared to play an important part in her social and learning difficulties. She had difficulties with verbal communication, and her non-verbal social contact with her peers led to antagonism and exclusion.

Renee’s interpersonal problems appeared to be associated with her hearing-related verbal communication difficulties. Verbal communication difficulties are indicated by:

- difficulties when listening, especially in noisy environments;
• less involvement in verbal communication than other students; and
• verbal communication which consists predominantly of declarative and directive statements such as, 'Look at this' or 'Sit here'.

Renee’s non-verbal compensatory attempts led to poor social outcomes.
Renee attempted to engage teachers and peers inappropriately, non-verbally and provocatively. She also displayed evidence of a general social immaturity:
• she played with a younger child outside school;
• she was looked after by older sisters outside school, and on the playground at school;
• she did not help at home;
• she sulked when chastised for inappropriate behaviour; and
• she was often moody and uncooperative at home and at school.

On the other hand she made regular attempts to be helpful, often after she had experienced difficulties while participating in classroom activities that depended on ‘teacher talk’. Her mother’s confirmation that home was a ‘noisy place’ suggests that in that environment, non-verbal rather than verbal communication skills had priority. Furthermore, because Renee had been viewed as ‘special’ by her sisters, and consequently had been ‘spoilt’ by them, she may have had minimal experience of the need to be aware of, or accommodating to, others’ desires. Her hearing loss would have further impeded her recognition of these. This suggests a possible interactive effect between hearing loss and family dynamics.
Similarities between the two case studies

Renee and Richard are of different genders and in different class grades, but there are some marked similarities between the behaviour patterns of these two students. When their developmental differences are taken into account, the similarities are even more marked:

- Both appeared to have difficulties with listening, and were prone to misunderstand things during verbal interactions with peers and teachers.
- Both had a strong focus on their social inclusion in the classroom, but experienced social difficulties.
- Their focus on their need for social inclusion interrupted their own and others’ work.
- Both tended to call out in class; Renee’s interjections were exuberant, whereas Richard’s were more calculated provocations of teacher and peers;
- Teasing others was an obvious characteristic of their social interaction with other students. With Renee, the teasing most often took the form of ‘telling on others’ and taking objects, and since hands-on activities are more usual at this grade level, there were plenty of available objects. Richard also told tales, and deployed a subtle array of verbal and non-verbal provocations, often designed to create trouble for others because they appeared to have broken school rules.
- The teasing by both Renee and Richard depended on a good understanding of the school rules, and close monitoring of others in the class.
- Despite their knowledge of the school rules, both were frequently chastised for breaking them.
• Both were sensitive to others’ responses; for example, Renee reacted when chastised by her teacher, Richard when others could see that he couldn’t do a piece of work. These differing concerns reflect their age level, as children in Transition are more focused on the adults in their life, while pre-adolescent upper primary students are more peer-oriented.

• Both appear to have had more difficulties in class when background noise levels were high.

• Both responded to noisy and quiet environments in ways that were consistently different from the responses of children without a hearing loss.

It is important for the methodological rigour of qualitative analysis to consider other possible explanations for the similarity of these classroom responses, aside from the shared experience of conductive hearing loss and difficulties with background noise.

Renee’s mother and teacher ascribed her behaviour to their view of her as a spoilt youngest child who had not learned to consider others properly. Her behaviour is certainly somewhat egocentric and demanding. However, this behaviour is more evident when the background noise level is high, and ‘being spoilt’ does not explain this variation. It may be, though, that if a child is ‘spoilt’ this factor may interact with hearing loss to exacerbate a child’s social difficulties. This study did not gather sufficient information on home environments to examine this proposition.

Another possibility is that some other shared condition may explain Richard and Renee’s similar responses. ADHD (attention deficit hyperactivity disorder) is the most probable of these. Many diagnostic symptoms for
ADHD (American Psychiatric Association, 2000) and the observed social responses from children with conductive hearing loss do overlap. Table 8.1 compares the two.

Table 8.1  Characteristics of ADHD and effects of conductive hearing loss

<table>
<thead>
<tr>
<th>Diagnostic criteria for ADHD</th>
<th>Effects of conductive hearing loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inattention</td>
<td>Problems with hearing make sustained attention to verbal input difficult</td>
</tr>
<tr>
<td>Often has difficulty sustaining attention in tasks or play activities</td>
<td></td>
</tr>
<tr>
<td>Often does not seem to listen when spoken to directly</td>
<td>Has difficulty hearing, especially when there is background noise</td>
</tr>
<tr>
<td>Often does not follow through on instructions and fails to finish schoolwork, chores, or duties in the workplace</td>
<td>Fails to hear or remember instructions</td>
</tr>
<tr>
<td>Often avoids, dislikes, or is reluctant to engage in tasks that require sustained mental effort (such as homework)</td>
<td>Avoids and dislikes tasks that require sustained listening or depend on misheard verbal instructions</td>
</tr>
<tr>
<td>Is often easily distracted by extraneous stimuli</td>
<td>Looking around is useful as a visual coping strategy</td>
</tr>
<tr>
<td>Hyperactivity</td>
<td></td>
</tr>
<tr>
<td>Often leaves seat in classroom or in other situations in which remaining seated is expected</td>
<td>Wanders around to observe what others are doing because can’t cope with listening demands</td>
</tr>
</tbody>
</table>

The key feature distinguishing social problems related to conductive hearing loss from those attributable to ADHD is that with ADHD the responses are pervasive; that is, they occur in every environment. With conductive hearing loss, the responses are likely to differ according to the quality of the listening environment and the availability of visual cues.

Both Renee and Richard most commonly displayed ADHD type behaviours when it was noisy. Richard’s teacher said that his behaviour was fine in a one-to-one quiet environment. He was also observed to work quietly on self-appointed tasks when there was little teacher pressure or likelihood of being
shamed. For example, in the library he read books quietly for an entire lesson period. Renee was observed to cause disruption by monopolising class equipment. However, she was also observed contentedly sorting through materials for long periods, especially if doing so meant she could avoid some language-centred activity. Accordingly, the evidence is that, for Richard and Renee, the behaviours in questions were not pervasive across different environments, and so a diagnosis of ADHD is not supported. Their behaviours are more plausibly related to conductive hearing loss.

Any explanation of Richard and Renee’s distinctive classroom responses, if not related to conductive hearing loss, especially when it was noisy, must also be able to explain why some responses were most evident when background noise levels were higher. There may be other intra-individual traits, such as language skills or intelligence that do contribute to the observed social responses. There may also be types of socio-economic disadvantage that contribute to the observed social responses. However, any alternative explanation would need to account for the variability of the responses at different levels of background noise. There appears to be no explanation for this, other than current conductive hearing loss and probable auditory processing problems, that can adequately explain why particular social responses were apparent at certain levels of background noise.

**Summary**

This chapter highlights the range of communication and social problems experienced by two children with conductive hearing loss, especially in noisy school environments. The next chapter explores, in more detail, the interaction of background noise and conductive hearing loss in shaping classroom social behaviour.
SECTION FOUR

RESULTS

Chapter Nine

Behaviour problems, hearing loss and background noise
Chapter Nine

Behaviour problems, hearing loss and background noise

This chapter presents the research results from two components of this embedded case study. These are components: B) nine background noise studies which examined the verbal interaction of students with and without conductive hearing loss when it was noisy and when it was quiet and C) a qualitative examination of the social responses of the target students which were often regarded as behaviour problems by their teachers.

It has long been known that it is more difficult for those with hearing loss to listen when there is background noise. Adults with hearing loss often avoid noisy contexts; however, students with hearing loss do not have this option if they are at school. This chapter describes the dynamic response of some Indigenous students when hearing loss and background noise made it difficult for them to listen to their teacher or classroom peers. It describes the way most students with hearing loss in this study displayed a pattern of responses, ‘teasing when noisy, talking when quiet’, that was often seen by their teachers as disruptive.

Background noise and verbal interaction

Social interaction in schools takes place in a variety of environments. Students spend most of their school day in classrooms, but also spend significant amounts of time in the corridors, the playground, the library and the assembly areas. The background noise levels vary in each of these places.
As a general rule, schools are places where there are often high levels of background noise, simply because they congregate large numbers of children together.

The relationship between background noise and social interaction was first noted in the data from school assemblies, one of the noisier of the school contexts examined in this study. This discovery was fortuitous, and resulted from repeated viewing of the videotape data to identify patterns of behaviour that would otherwise have remained unseen. It became evident that an examination of the children’s communicative behaviour during the school assemblies could lead to a better understanding of the behaviour of children with conductive hearing loss.

School events which bring the whole school together are likely to create some of the highest background noise levels found at any time during ‘staff managed’ school time, with noise peaks during assemblies that come close to some of the noise levels found in playgrounds during breaks. Background noise levels during assemblies were found to cover a wide range; up to 90 dB during breaks between items on the assembly agenda, and down to 65 to 70 dB when teachers were passing on information and presenting awards or during class ‘items’, such as songs, plays, poems and dances.

The important role that background noise can play was fortuitously discovered during the examination of a videotape which had focussed on a target student during one assembly. A contrast between the social contact of a target student and the behaviour of the surrounding students became apparent. The verbal communication by a target student seemed to be inversely related to the level of background noise.
I was fast forwarding the video featuring Alana during an assembly. Alana was staring forward with her head on her hands while her peers were in animated social interaction. Then, when her peers fell still and silent to attend to what was happening on stage, she erupted into communicative activity. (Researcher notes)

Her communicative behaviour was the opposite of that of the other students. When they talked, she remained silent; when they were silent, she talked. Examining the video at normal speed with the sound on, it became apparent that the background noise levels differed markedly. It was very noisy when the other children were speaking and Alana was silent. It was relatively quiet when the other students were silent and Alana attempted to speak to her peers. This prompted the hypothesis that background noise might be a factor that interacted with hearing loss to shape the target children’s social interaction at school.

Observations of number of students during assemblies indicated that most target students’ generally attempted to communicate during times of low background noise. These results are presented below.

**Janet and Kirsty**

Janet and Kirsty, both target children from Year 1, were observed during a school assembly.

Janet attempted to instigate social contact with another student eight times but was rebuffed each time, and the other student finally moved away. Janet then turned her attention to Kirsty, a classroom peer, also with a hearing loss. However, she was also constantly rebuffed by Kirsty, who not only refused to interact but also moved away several
times, each time sitting closer to the teacher, followed closely by Janet.

(Notes from video observation)

Janet, like Alana and June, attempted to speak during the quiet periods, but her communicative efforts were rebuffed. This highlights one risk that faces students who attempt to speak during the quiet times; their peers may rebuff their communicative efforts.

While Janet’s social rejection highlights one possible consequence of breaking school rules when attempting to talk during quiet periods, another consequence is that a student may be reprimanded or disciplined by teachers when they do so. This happened with Sam, another target student.

**Sam**

Sam, a Year 2 student, was also observed during assembly. Sam, at the beginning of one assembly, spoke to a peer when not allowed to do so (during a period of quiet) and was pulled out of his class group to sit by himself for the rest of the assembly. Speaking when silence has been asked for is a breach of school rules. Students who do so run a high risk that they will be disciplined if they speak when they should not. Richard, another student who broke the rules about talking during assembly, took care that he would not be caught doing so by the teachers.

**Richard**

Richard, a Year 5 target student, and one of the subjects of the case studies discussed in Chapter Eight, was also videotaped during assembly. His verbal communication was very limited during periods of high background noise. However, he did interact with his peers in other ways. These were generally non-verbal, provocative and disruptive. As the noise level in the assembly increased, he unleashed a flurry of pokes and prods that targeted those
around him. He was highly conscious of his teacher’s presence, and managed his harassment of his peers to ensure that it took place while his teacher was either some distance from where he was sitting or had her attention focused elsewhere.

A series of nine ‘background noise studies’ were compiled to further examine the relationship between conductive hearing loss, background noise levels and verbal interaction. These involved comparing the number of verbal interactions and/or time spent in verbal interaction of Indigenous students with and without a current conductive hearing loss, in noisy and quiet conditions. Note the quantitative data in these studies are embedded within a qualitative research framework which uses ‘replication logic of justification’, not ‘sampling logic of justification’. This means that considerations of sample size and representativeness that would be important for a quantitative research method using parametric statistical analysis are not relevant in this context.

**Background noise study one**

Data were compiled from video recordings of the verbal interaction of Alana compared with that of a peer ‘control’. The control student was selected on the basis that she was an Indigenous same-sex peer with no current hearing loss, who was in the same video frame but not adjacent to the target student. The following table (Table 9.1) presents information on the number of verbal interactions observed on the videotape, when they occurred, and who instigated them. In this and subsequent tables, the figure in brackets denotes interactions that were self-instigated.
Table 9.1  Alana’s verbal interactions during 27 minutes of school assembly

<table>
<thead>
<tr>
<th></th>
<th>Number of verbal interactions when quiet (below 70 dB)</th>
<th>Number of verbal interactions when noisy (above 70 dB)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Target (Alana)</strong></td>
<td>16 (14 self instigated)</td>
<td>0</td>
<td>16</td>
</tr>
<tr>
<td><strong>Control</strong></td>
<td>7 (3)</td>
<td>11 (5)</td>
<td>18</td>
</tr>
</tbody>
</table>

Chi Square analysis; p is significant (less than or equal to 0.001) although some cells less than 5.

There is a significant difference in when Alana communicates verbally, compared to a peer without hearing loss; there is only a one in one thousand probability that this was due to chance. While the total number of verbal interactions by each student was similar (18 as against 16), the timing of these interactions differed. Alana had no verbal interactions during the noisy periods. During this time, she mostly sat with her head resting on her hands, looking ahead. All of her interactions took place when assembly items were being presented, when the rest of the audience, as instructed, was largely silent. The majority (14 out of 16) of her interactions were instigated by her. Typical of these was leaning close to the Indigenous student on her left, cupping her hand to her ear while speaking to her, and the student she spoke to replied in the same manner. In contrast, the majority of the verbal interactions observed for the control student (in this case a non-Indigenous student without hearing loss) occurred during the periods when the audience was waiting for the assembly to start, or during the breaks, or while waiting for a new assembly item to begin. These were times when students were allowed to speak and most students were talking, hence the high level of background noise.
Background noise study two

Table 9.2  June’s verbal interactions during 17 minutes of school assembly

<table>
<thead>
<tr>
<th></th>
<th>Number of verbal interactions when quiet</th>
<th>Number of verbal interactions when noisy</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Target (June)</strong></td>
<td>11 (10 self instigated)</td>
<td>1 (1)</td>
<td>12</td>
</tr>
<tr>
<td><strong>Control</strong></td>
<td>3 (1)</td>
<td>10 (3)</td>
<td>13</td>
</tr>
</tbody>
</table>

Chi Square analysis; p is significant (less than or equal to 0.001) although some cells less than 5.

As with Alana, June instigated most of the verbal interactions that she participated in during 17 minutes of videotaped assembly time, and they mostly occurred when it was quiet. This is in contrast to the interactions of the control student who spoke mostly when it was noisy.

Four of the target children observed during schools assemblies exhibited a pattern of verbal interaction that was atypical when compared with the behaviour of their peers. These four attempted to instigate verbal interaction with their peers when it was quietest. One of these was punished for talking when he should have been quiet. The social overtures of another were rejected by her peers.

**Background noise study three**

Another target student was observed during assembly whose verbal responses did not fit this pattern of talking when quiet.
Table 9.3  
Kirsty’s verbal interactions during 23 minutes of school assembly

<table>
<thead>
<tr>
<th></th>
<th>Number of verbal interactions when quiet</th>
<th>Number of verbal interactions when noisy</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Target (Kirsty)</td>
<td>0 (0 self instigated)</td>
<td>4(0)</td>
<td>4</td>
</tr>
<tr>
<td>Control</td>
<td>4 (3)</td>
<td>23 (13)</td>
<td>27</td>
</tr>
</tbody>
</table>

Chi Square analysis; p is not significant (less than or equal to 1) although some cells less than 5.

Kirsty hardly spoke at all during assembly. She complied with the expectations of silence at certain times. However, she did not seek to speak when the children were allowed to do so either. Kirsty was highly focused on the teacher, silent and socially isolated throughout the assembly. As we shall see later, Kirsty is also a highly compliant student in class.

**Classrooms**

School assemblies are among the noisiest places found in schools. They are the environment in which verbal communicative difficulties related to background noise are likely to be most evident. However, it is in classrooms, where students spend most of their school time, that this type of behaviour has most implications for learning. The videotape footage taken in the classrooms was examined to see if the general pattern of behaviour observed in assemblies (‘talking when quiet, silent when noisy’) was also evident in that setting.

The videotapes of the target children were examined for instances where background noise variations were evident, and where there were good data
on the students’ social interactions. The results of this examination, for the
different target children, are presented in the individual tables that follow.

**Talking when it was quiet, silent when it was noisy**
Six of the eight target children were observed attempting to talk when it was
quietest in class. The other two did not seek to talk to others at such times,
but they also appeared more socially isolated than the other target students
in their class. Data for the six target children who often spoke when it was
quiet are described below.

**Background noise study four**
Tina, a Year 5 target student, grew up in a remote Indigenous community
before coming to town with her family. She was observed during a 31 minute
period, a hands-on science lesson.

**Table 9.4** Tina’s verbal interactions at different noise levels during 31
minutes of ‘Work at Tables’

<table>
<thead>
<tr>
<th>Verbal interactions</th>
<th>Number of verbal interactions when quiet</th>
<th>Number of verbal interactions when noisy</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Target (Tina)</strong></td>
<td>6 (4 self instigated)</td>
<td>2 (1)</td>
<td>8</td>
</tr>
<tr>
<td><strong>Control</strong></td>
<td>2 (0)</td>
<td>15 (8)</td>
<td>17</td>
</tr>
</tbody>
</table>

Chi Square analysis; p is significant (less than or equal to 0.01) although some
cells less than 5.

Tina spoke less than her control in total, and mostly when the background
noise level was low; when it was noisy she was mostly silent. While Tina’s
verbal interactions almost ceased as noise levels rose, as with Richard during
the assembly, her non-verbal interactions increased. She became actively engaged in teasing her peers and her teachers in a manner that was highly disruptive. Her teacher disciplined her more than any other student in class during this time.

Tina was videotaped again on the same day, immediately after lunch, during a period of silent writing. During this activity the students could write about whatever they wished. As the term ‘silent writing’ implies, this period was one in which there was an expectation that the students would not to talk. Thus, there was no noisy time during this period to provide opportunities for contrasting types of verbal interaction. Tina’s verbal interactions were monitored during a 27 minute period, as were those of another Indigenous same-sex peer without hearing loss. The number of verbal interactions and the total time spent on these interactions is set out in the Table 9.5. The background noise level during this period was about 65 dB, throughout the lesson.

Table 9.5  Tina’s verbal interactions during 27 minutes of ‘Silent Writing’

<table>
<thead>
<tr>
<th></th>
<th>Number of verbal interactions</th>
<th>Total duration: minutes and seconds</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Target (Tina)</strong></td>
<td>15 (14 self-instigated)</td>
<td>6.23</td>
</tr>
<tr>
<td><strong>Control</strong></td>
<td>2</td>
<td>0.55</td>
</tr>
</tbody>
</table>

Tina talked when she was expected to be quiet. However, on this occasion she demonstrated little non-verbal contact and her interactions appeared to involve less teasing. Tina was disciplined twice for talking during this period.
The effect of background noise levels on Tina’s verbal interactions can perhaps be seen more clearly when presented as a percentage of the time spent engaged in verbal interaction when there are different levels of background noise.

Table 9.6  Tina’s proportion of time in verbal interaction in noisy and quiet settings

<table>
<thead>
<tr>
<th></th>
<th>High background noise level</th>
<th>Low background noise level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tina</td>
<td>6 per cent</td>
<td>29 per cent</td>
</tr>
<tr>
<td>Control</td>
<td>45 per cent</td>
<td>4.2 per cent</td>
</tr>
</tbody>
</table>

Note: This table compares Tina and two control students in two different settings. In different class settings Tina consistently tried to talk when it was quiet.

**Background noise study five**

Renee is an Indigenous child in Transition (the first year of primary school). Her classroom behaviour is described in Case Study Two. She was videotaped during a 19 minute period of class time, when the class was working in groups that were moving from one group activity to another. During this lesson, background noise levels ranged from 50 to 60 dB when the students were silent and listening to the teacher, to 60 to 70 dB when there were involved in group activities, to 70 to 80 dB when they were moving between activities and packing up.
Table 9.7  Renee’s verbal interactions at different noise levels during 19 minutes of class group work

<table>
<thead>
<tr>
<th>Verbal interactions</th>
<th>Number of verbal interactions when quiet</th>
<th>Number of verbal interactions when noisy</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Renee</td>
<td>8 (5 self instigated)</td>
<td>3</td>
<td>11</td>
</tr>
<tr>
<td>Control</td>
<td>15 (6)</td>
<td>19 (11)</td>
<td>34</td>
</tr>
</tbody>
</table>

Chi Square analysis; p is not significant (0.10).

It is the control student who speaks both when it is quiet and noisy that influences the statistical comparison. Renee’s verbal communications were fewer in number than those of the control student and mostly occurred when background noise levels were lower. She was disciplined three times by the teacher during this time, and more so than any other student. There were also specific indications that Renee chose to communicate verbally more when the background noise level was lower.

This is the first occasion that Renee has participated in verbal interaction in class during this activity. It is immediately after the teacher quietened the other students down, when most other groups are working at a quiet level and background noise is at a minimum.

(Research notes)

Like Tina and Richard, Renee also had more non-verbal interactions during the lesson than the others, increasingly so as background noise levels increased. These interactions often disrupted the work of others and often involved socialising through the use of objects. For example, as she moved to each activity she grabbed the materials that were to be used and became the
self appointed dispenser of them. She often hoarded these, giving them to others reluctantly and taking them away from students with fewer than she had when she had no need for them herself, as was described in Case Study Two (Chapter Eight).

While care needs to be taken in any comparison of the verbal interactions of students in different contexts and over different time periods, it is helpful to look at the number of Tina and Renee’s verbal interactions, as well as when these took place. The following table (Table 9.8) combines the results of Tables 9.5 and 9.7.

<table>
<thead>
<tr>
<th>Verbal interactions</th>
<th>Number of verbal interactions when quiet</th>
<th>Number of verbal interactions when noisy</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tina and Renee</td>
<td>14 (74 per cent of total)</td>
<td>5 (26 per cent of total)</td>
<td>19</td>
</tr>
<tr>
<td>Controls</td>
<td>17 (33 per cent of total)</td>
<td>34 (67 per cent of total)</td>
<td>51</td>
</tr>
</tbody>
</table>

Tina and Renee communicated verbally less than half as much as the control students. Two-thirds of Tina and Renee’s verbal interactions took place when it was quiet, while two-thirds of the control students’ verbal interaction took place when it was noisy.

**Background noise study six**

Rachel, Janet and Kirsty were videotaped during a 2 minute 20 second corridor transition between activities. This was a period when the background noise level was high and when students were allowed to talk.
The amount of time each spent in conversation was compared with an individual control student for each of the three girls.

Table 9.9 Time spent in verbal interaction in a noisy corridor

<table>
<thead>
<tr>
<th>Target students</th>
<th>Control students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rachel: 0 seconds</td>
<td>36 seconds</td>
</tr>
<tr>
<td>Janet: 4 seconds</td>
<td>29 seconds</td>
</tr>
<tr>
<td>Kirsty: 0 seconds</td>
<td>28 seconds</td>
</tr>
<tr>
<td><strong>Total time: Target students</strong></td>
<td><strong>Total time: Control students</strong></td>
</tr>
<tr>
<td>4 seconds</td>
<td>93 seconds</td>
</tr>
<tr>
<td><strong>Average/student: 1.3 seconds</strong></td>
<td><strong>Average/student: 31 seconds</strong></td>
</tr>
</tbody>
</table>

The target students, on average, spent less than 2 per cent of their time in conversation while the control students, with no hearing loss, spent an average of over 20 per cent of this time conversing with others.

**Background noise study seven**

Not all the target students were observed to be talking less than the other students did when it was quiet, on every such occasion. On one occasion Richard was seen to talk more than the other students, with no apparent regard for the level of background noise.

Table 9.10 Richard’s verbal interactions at different noise levels during 10 minutes of class time

<table>
<thead>
<tr>
<th>Verbal interactions</th>
<th>Number of verbal interactions when quiet</th>
<th>Number of verbal interactions when noisy</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Richard</strong></td>
<td>13 (12)</td>
<td>15 (10)</td>
</tr>
<tr>
<td><strong>Control</strong></td>
<td>2 (0)</td>
<td>8 (5)</td>
</tr>
</tbody>
</table>
Chi Square analysis; p is not significant (0.2).

On this occasion, Richard talked a lot when it was quiet as well as when it was noisy. However his talk in both circumstances often involved brief comments to, or provocation of others. An analysis of the time spent in interaction demonstrated this.

**Table 9.11** Richard’s time spent in verbal interactions at different noise levels during 10 minutes of class time

<table>
<thead>
<tr>
<th>Verbal interactions</th>
<th>Time spent in verbal interactions when quiet</th>
<th>Time spent in verbal interactions when noisy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Richard</td>
<td>39 seconds</td>
<td>67 seconds</td>
</tr>
<tr>
<td>Control</td>
<td>13 seconds</td>
<td>205 seconds</td>
</tr>
</tbody>
</table>

Chi Square analysis; p is significant (less than or equal to 0.001).

These interactions were mostly instigated by him and almost always ignored by those they were directed to. In effect, they were public provocations on Richard’s part, and not reciprocal dialogues, during which he would have had to listen as well as talk.

‘Talking when quiet, teasing when noisy’ - a behaviour problem

The times when it was quiet in class were mostly times when students were not allowed to talk because the teacher was talking, or because the teacher wanted the children to engage in a classroom work activity. Talking when quiet was liable to be seen as unacceptable behaviour.
Renee’s (Case Study One, Chapter Eight) teacher was observed chastising her on a number of occasions when she spoke when it was quiet in class, after the teacher had asked for silence. Several of these occasions involved exuberant interjections from Renee in response to public comment by the teacher. For example, the teacher had asked students to stand quietly at their tables while she explained what she wanted them to do next, and Renee called out about what her table had been working on. On one occasion Renee’s interjection came after a period of small group activity when Renee had participated little in the discussion of the other students she was working with. In effect, she ‘conversed’ in public when not allowed to do so, after remaining silent when she was allowed to talk and it was noisy.

Richard was often chastised for his regular interjections when it was both quiet and noisy. However, his teacher had begun to ignore his interjections and had urged other students to do the same. So the teacher, rather than responding to Richard’s interjections, chose instead to encourage the other students to ignore his most recent interjection.

Teasing is the most common form of disruptive behaviour in Indigenous schools, especially in remote schools. The capacity of children to handle teasing has been identified as a key indicator of school readiness by Indigenous teachers at Maningrida (personal communication, 1988). However, excessive involvement in the teasing of others, and a volatile response to being teased, from individual students, can be a significant cause of disruption in many classrooms with Indigenous students (Christie, 1986). Excessive teasing can lead teachers to conclude that a student has a behaviour problem and it can make the student unpopular with their peers. Both these things happened, and especially the latter, as a result of teasing observed during this study.
Renee was described as a very unpopular student, as were Tina and June. The observations revealed that Kirsty did have social difficulties, and most of Richard’s classmates showed evidence of an attitude of quiet exasperation when confronted with his behaviour. It would appear that conductive hearing loss and background noise can inhibit the capacity of a child to engage successfully in verbal interaction.

Renee’s teasing of others, including her teacher, when she was having difficulties in understanding verbal instruction, appears to be an attempt to entertain herself by ‘playing’ a game she can enjoy instead of participating in an activity which she is not good at. However, Richard’s teasing and calling out often seems to be designed to avoid participation in activities when he has not understood the instructions. There may be developmental progression from one type of behaviour to the other given the different ages of these two students; Renee was in ‘Transition’ (the first year of primary school) and Richard was in Grade Five.

There are two main explanations for the association between ‘talking when quiet’, conductive hearing loss and background noise, and the apparent difficulties created by a combination of conductive hearing loss and background noise.

- Some students seem to seek out the quietest times during the school day for talking. During those times they have the best chance of engaging in successful two-way conversations, because they will be more likely to hear the replies from the student they are talking to. For some children ‘talking when quiet’ appears to be an attempt to overcome the social exclusion they experience at other times when
faced with the combined effects of conductive hearing loss, background noise and the socially controlled school environment.

And/Or

- The children may find it difficult to learn from ‘teacher-talk’ because of their conductive hearing loss, and this may encourage them to give up on their attempts to listen to teaching instructions and instead seek other ways of entertaining themselves. Talking is one of these.

There is evidence for both these explanations in the data. Tina engaged in more talk during silent reading when the teacher was not talking, although the reading task may also have been one she wished to avoid. Some children, Tina being prominent among them, were observed to be silent but playing with objects and moving around to observe other events during teaching instruction.

However, the results of other research (Lowell, 1994), and teacher training programs based on the results of the research described in this document, provide support for the second explanation. When teachers provide instruction in ways that help students to overcome their listening difficulties for example, by using an amplified signal (Massie, 1999) or repetitive teaching strategies and visual cues (Howard, 2004), students appear to pay more attention to their teachers and to talk less when it is quiet. On the other hand, support for both explanations is provided in work carried out with adults with listening difficulties (Howard, 2005). Indigenous apprentices recall that their hearing loss impacted most on their ability to understand teacher’s instructions, but they also recall its influence on their social contact at school. Their greatest concern with their peers was being shamed in from
of them, because they didn’t understand instructions or couldn’t answer questions.

The target children in this study had problems when communicating verbally in noisy situations, not only in the classrooms, but also in other places. Noisy playgrounds presented them with very real communication challenges.

**Playgrounds**

It is generally assumed that students have an opportunity to socialise freely during the out-of-class break times. However, for children with a hearing loss, this may not be the case. Hearing-related communication problems and high levels of background noise combine to restrict the opportunities for verbal communication in a number of different environments.

Playgrounds, like school assemblies, congregate large groups of students, but without any teachers present to control the noise levels. This means that noise levels around the playground areas where the children tend to gather (such as play equipment, water fountains and during group games) remain consistently high. The researcher recorded noise levels of about 84 dB around playground equipment. Playground interactions were not recorded on videotape, but when interviewed the older of the target students and the friends of target children identified the playground as a difficult place for verbal communication.

**Richard**

Richard, whose classroom behaviour was outlined in Case Study One (Chapter Eight), described the trouble he has with hearing when playground background noise levels were high, and especially when he was playing
team sports or near play equipment. Richard also commented that background noise was a problem for him during other out-of-class activities, for example, when lining up after breaks and waiting to come inside.

Sometimes [it is hard to hear] when [the teacher] is talking to us on the ground and sometimes with the music [music sounds for a few minutes as a signal to begin and end breaks]. (Research notes)

**June**

June was a Year Four student. She said she had difficulties the teacher was speaking or when the class was in the playground. She also had difficulty hearing the music that signalled the end of breaks. June’s teacher stated that June relied heavily on a ‘special friend’ who helped her with work in class. This ‘special friend’ was very aware of the communication problems experienced by June and described the problems June experienced when dealing with playground noise.

June’s friend said she had difficulty hearing her friends when on the playground, which meant that they sometimes became angry with her. She said June’s favourite place for play was the oval furthest from the school where it was quietest. However, she said that they sometimes got into trouble for being late to class because it took them a long time to get back to where they had to be to line up, and that it was sometimes difficult for them to hear the music that signalled the end of the break. She noted that June rarely heard the music. The friend said she sometimes gets angry with June ‘When I’m trying to talk to her she keeps going’; June misses the social cues that signal that her friend wants to talk to her, or keeps talking because she does not hear her friend begin to talk.
For the target children, it was evident that the high levels of background noise on the playground contributed to their social difficulties in interacting with their peers and playing sport. Further, their difficulties in communicating with their peers on the playground may mean that, for them, the quiet of class time offers the best opportunity for social verbal communication with their peers.

**Disconfirming Evidence**

The data were also examined for disconfirming evidence of the perceived tendency for the target students with current hearing loss to talk more when it was quiet. The numerical counts tabulated in this chapter show clearly that a number of the target students did talk when it was noisy, but they did so less than the control students who could hear well. However, two of the target students did not fit the pattern of ‘talking when quiet, teasing when noisy’. These two students were notable because the observations showed that they seldom engaged in verbal communication with their peers, their engagements were minimal, and they were quiet most of the time. Their classroom behaviour was different from that of the other target students, but also unlike that of other Indigenous students with normal hearing. Their behaviour followed a different pattern; a pattern, however, that showed an alternative way of dealing with conductive hearing loss in the classroom. These children are silent when high background noise levels tend to inhibit conversation for children with conductive hearing loss, and also silent when it is quiet enough for them to converse, because at those times they are not allowed to talk.

**Students who are silent at school**

Two target students were notably silent throughout the school day. They were generally silent when background noise levels were high because other
students were talking, and also silent when others were silent, in accordance with the expectations of their teacher. These target students appeared to be socially isolated at school.

**Background noise study eight**

Observations showed that Sam, the student who was disciplined for speaking during assembly, was largely socially isolated in class. During the periods when he was observed, he spoke to, or interacted with others remarkably little.

Sam, a Year Two student, was observed in class (not recorded on videotape) during an early morning period of free play. Students, as a first activity in the morning, were allowed to play with toys for twenty minutes. There are consistently high levels of background noise throughout the activity (level not recorded). During this time Sam plays with a truck. Other students are generally playing in twos and threes, but Sam plays alone. On three occasions other students approach Sam and instigate joint activities. During these encounters Sam is silent in response to other students’ conversation. He responds to their chatter with a fixed smile. He does not seek to avoid them but ‘fits in’ with what they are doing without engaging with them verbally or actively contributing to the game. He gives the appearance of playing a parallel game even when together. On two occasions he disengages and moves away from the students. On a third occasion they move away from him. In contrast to the other students’ constant talk, he is not observed to say a word during this period. (Research notes)

Sam attended ESL classes and his teacher commented that he was one of the least talkative of any of her students. He had been involved in ESL classes
because of concern about his language development, although he came from a language background similar to that of most of the other target children, and they were not involved in ESL programs. The only occasion his teacher recalled any active involvement by Sam was out on a bush tucker trail, when he knew many of the bush foods. Sam seldom interacted with those around him and was seen refusing help from his teacher.

Sam is observed during an hour and half period of classroom activity. In group activities on the floor he constantly observes those around him but interacts little. When called upon to answer a question he often simply waits until the teacher moves on to another student. He responds to teacher questions with the same forced smile in evidence when peers approach him. When working at a table in class he is only observed to work alone. On one occasion Sam’s teacher is observed to approach him asking if he needed help. He shakes his head ‘no’ in response. However, he fails to complete the work and has not correctly completed the work [he has done]. (Research notes)

During a twenty minute period of observation of work at tables, with background noise levels ranging from 65 to 80 dB, Sam had only two verbal interactions, both instigated by another student. This is displayed in Table 9.12.

<table>
<thead>
<tr>
<th>Table 9.12</th>
<th>Sam’s Verbal Interactions during 24 minutes of ‘Work at Tables’</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. of verbal interactions</td>
</tr>
<tr>
<td><strong>Target (Sam)</strong></td>
<td>2</td>
</tr>
<tr>
<td><strong>Control</strong></td>
<td>9</td>
</tr>
</tbody>
</table>
Sam’s teacher said he had major problems with conceptual information, but that he was in no way a behaviour problem. She was not aware of his apparent social isolation in class. When Sam’s social interaction was observed, he often appeared to have a worried and apprehensive look on his face.

**Background noise study nine**

Kirsty was a target student in Year 1/2 who appeared remarkably attentive in class despite background noise. Indeed, she was very teacher-focused, appearing to be highly compliant with teacher expectations. Kirsty often sat up straight in an exaggerated fashion when the teacher wanted people to be quiet. She was observed working diligently at assigned tasks and immediately showed her completed work to the teacher. She was not at anytime observed displaying disruptive verbal or nonverbal behaviour; indeed, more than other target students, she seemed to seek teacher approval. While she conversed with peers, she generally did so less often than other target students. Her verbal interactions were most often work related, such as showing a peer where she was up to with a task, looking at where a peer was up to, and discussing what work to go on to next. Her interactions tended to be instigated in equal numbers by herself and her peers.

Kirsty’s teachers (who worked in a team teaching situation) were surprised to discover she had a hearing loss; they regarded her as one of ‘the attentive good listeners’. However, despite her quiet compliance and focus, Kirsty was not progressing as well academically as her teachers expected her to do.

Teacher 1: Well, you watch her there on the floor and she really does pay attention, but Kirsty doesn’t produce does she?
Teacher 2: No, she always listens very hard, but her work doesn’t show that. You look over at the table and she’s always busy doing something. She’s not wandering and wondering what to do next. She knows what to do.

Teacher 1: I hadn’t thought of her as having problems [with hearing] because she always paid attention. She said to me ‘My mum said I must be a bit deaf’ and I said, ‘Why’s that?’ and she said ‘Because I don’t always hear what she says’. So I said, ‘Oh, do you hear what I say during class?’ and she sort of looked a bit sheepish and said ‘No, not always’. And I was really, really surprised. She was one of my best listeners.

Teacher 2: She usually sits in the same place, near the front; she never puts herself at the back or at the side. She doesn’t mess around, she watches. She doesn’t fiddle with her dress or shoelaces or anything like that. She gives the impression that she’s brighter than she is really.

Teacher 1: Kirsty is always sitting in the right place looking at the right person. She wants to do it nicely. She tries so hard. I had no idea that she was having any difficulty.

Unlike most of the target children, Kirsty and Sam’s teachers did not regard them as students with behaviour problems. They were not involved in disruptive or what is seen as anti-social behaviour. Instead, they were unobtrusively socially isolated at school. Kirsty was highly focused on her teacher and tried hard to please. Sam stayed out of the way of teachers and his peers as much as he could.
The explanation for these children’s responses appears to stem from a desire to abide by school rules. The combination of conductive hearing loss and noisy school environments presents many children with a forced choice. If children with conductive hearing loss wish to have the best chance of successful verbal communication with their peers while in the classroom they need to break school rules and ‘talk when it is quiet’. It appears some children with conductive hearing loss choose instead to comply with school rules. They are silent when expected to be silent, and when allowed to talk the combination of hearing loss and background noise is an obstacle that prevents them from engaging in verbal communication.

**Isolation of students at school**

**Managing behaviour by isolating students**

For those target students who are disruptive in class, social isolation is sometimes a consequence of their attempts to talk when it is quiet, or their other disruptive behaviour. Teachers commonly use isolation of students as a strategy to manage student behaviour. There is a brief description near the beginning of the chapter of the incident when Sam was isolated from the rest of his class group at a school assembly, after he spoke when expected to be quiet. Tina’s teacher often attempted to isolate her from the other students, with varying degrees of success. Richard’s teacher often urged other students to stay away from him. June’s teacher said that she managed June’s propensity to get involved in fights by isolating her in class. She explained, ‘She’s settled down, but I’ve had to keep her away from that group of girls that she used to be really silly with’.
Self-imposed isolation in class

While for the majority of the target students it was their disruptive attempts at social contact that were most noticeable in class, they were also often isolated. Richard was often isolated in class while others were working together in groups; even when he was part of a group he often did not participate in the activities (Case Study One, Chapter Eight). Despite Tina’s at times outrageous attempts at interaction with others she was otherwise often isolated when others conversed in class. Observations of June indicated that she often isolated herself in class; on four videotaped occasions she either ignored or rejected social overtures by other children. June said herself that sometimes she chose to isolate herself because she found it difficult to hear when there is background noise.

June: Sometimes I think that people are whispering and think that they are whispering because they don’t want me to hear. That makes me angry and I walk away.
Interviewer: What do your friends say?
June: They say they weren’t whispering.
Interviewer: Is there a place where this happens most?
June: Under the verandah.

Under the verandah at break times was one of the noisiest places on the school grounds. June is likely to have trouble listening with this level of background noise, while other students without listening problems would be able to hear each other. June’s interpretation of the other students’ better ability to listen in the presence of background noise is that the other girls are actively attempting to exclude her by whispering. If indeed the others are not whispering to exclude her, June, not understanding about her reduced ability to listen in the presence of background noise, becomes suspicious, frustrated,
and excludes herself socially. Suspicion, paranoia, and lower levels of participation in social activity are more frequent among adults with untreated hearing loss (The National Council of the Aging, 1999).

**Teasing when it is noisy in class**

While they did not interact verbally when it was noisy, the majority of the target students were observed instigating non-verbal, often provocative, social contact with their peers, and sometimes with their teachers when background noise levels were high. These students generally demonstrated a pattern of responses that involved ‘talking when quiet, teasing when noisy’.

The following data and information are drawn from observations of five students who displayed this pattern of behaviour.

**Tina**

Tina’s verbal interactions diminished as background noise levels rose during a 31-minute period of videotaped interaction. During the second half of the 31 minutes, the other students were progressively finishing their work and beginning to converse, thereby raising the level of background noise. As it rose, Tina’s verbal interactions almost ceased. However, her non-verbal interactions, especially teasing, increased as the noise level rose. During this time Tina:

- grabbed a stapler and shot staples at another student;
- gave a piece of paper to a peer then grabbed it back;
- reached over and touched the face of a peer who was working;
- took an object from the desk of a peer;
- teased another peer by offering a paper then pulling it away;
- ignored a teacher aide who called to her;
- played with the switch on a computer as another student was trying to use it;
• jabbed at the keys of the computer despite the efforts of a teaching aide to prevent her doing so;
• poked at the aide until the aide told her to go away;
• was chastised by a peer for messing up the connections on the computer; and
• took a ruler from the aide then threw it back on her desk.

She was also helped one-to-one by the aide, ‘told on’ to the teacher three times by other students, and chastised twice by the teacher. When the aide corrected her work she snatched it back refusing to show it to her.

Tina’s activity, during this period of high background noise, aside from the spell of one-to-one help from the aide, was non-verbal and provocative. Objects played a large part in her attempts at social interaction. A pattern Tina repeated several times during this period was to take an object and then wait for, or prompt someone to try and get it back. Her teacher reported that Tina had developed a reputation in class for stealing. However, it seems that she took things (objects), not because she wanted to have the objects for themselves, but to obtain a response from others. When possession of an object failed to provoke a response, she quickly abandoned it. While Tina’s interaction during this time was mainly based on teasing others with objects, she also sought to provoke others into interaction in other ways; by shooting staples, by touching the face of a peer, by poking. Her teacher described this type of teasing as typical for Tina.

Tina was also observed during an art class and science lesson. The hands-on materials in these classes gave Tina even more scope for using objects to make social contact. She took materials for the whole class and refused to give them back, took materials from other students, was disciplined by the teacher eight times in one lesson (the other students, in combination, were
disciplined ten times). Tina’s verbal responses decreased and her nonverbal provocative social responses increased as background noise levels rose.

Tina’s classroom responses with peers and teachers were the most overtly confronting of all those displayed by the target students. The fact that she had come from a remote community, knew less English and was less familiar with urban school expectations suggests that the combination of cultural unfamiliarity, hearing loss and background noise was presenting her with multifaceted and complex communicative and social challenges.

Tina’s teacher regarded her as a student with significant behavioural and social problems. She attributed these to poor motivation and personality traits.

Teacher: She's sneaky I s’pose. If she can get away with sneaking out of my line of vision and doing something else she will. She doesn't want to work at all. She just comes to school basically to play with everything and touch a lot of people’s things; she is really bad at that. And the other kids just don’t like it, they really hate it. And also Tina was going through a stage where she was hurting people but not so I could see...little pinches and underhanded things. I was told by her former teacher to keep an eye on her because she's got the ability but just sits there and says ‘No I won’t do it’ and refuses to do it. But she's slowly getting there, once she sits down and she knows you mean business, and you're keeping an eye on her, I have to really keep an eye on her, because I get sidetracked and then bang she’s off, she knows when I’m sidetracked. If Trish is away it's a different day. One day she and Ed (another disruptive student) were away and it was just so quiet and everyone was working, it was wonderful, they were
all working at their maths stations, they were all busy talking maths and working out things and the problem solving is getting into a group and talking. I just find when she is there there's more disruption, the lesson's very disjointed, and you’re always...oh so and so has hurt me and so and so…

It is evident that Tina’s teacher has a negative attitude towards Tina. Malin (1989) suggests that these types of negative attitude ultimately act to restrict the educational opportunities of Indigenous children. Tina’s teacher described a situation in which the management of Tina’s disruptive behaviour took a lot of time and it was behaviour that often had a negative impact on the whole class; as evidenced by the teacher’s comments about a better class learning environment when she is away. The teacher was not aware that hearing loss or the interaction of hearing loss and background noise might have been having an effect on Tina’s classroom behaviour. Howard (1992, 2004) noted that the children with conductive hearing loss in one urban classroom were the students who were most disruptive, and also the most in need of one-to-one help.

Richard
Richard was also provocative when classroom background noise levels were high. His social interactions with his peers at those times were generally characterised by teasing. However, he seldom made use of objects when doing so, in contrast with the behaviour of the younger target students whose practical ‘hands-on’ lessons provided them with more opportunity for the use of objects. Richard’s teasing involved a diverse and subtle range of physical and verbal provocations.
Richard’s non-verbal teasing of his peers at assembly is described in Chapter Eight. In class, his teasing often involved attempts to get others into trouble by ‘telling on them’ for breaking rules that they had not, in fact, broken. He often acted in this way to entertain a small group of male peers. His responses are described in detail in Case Study One (Chapter Eight).

However, he did not always focus on individual students. Sometimes his responses were more public, though still provocative in the way they contravened expected behaviour norms in class. They were also disruptive because they distracted others. During an observed series of lessons, Richard:

- bounced a ball consistently throughout one lesson;
- made lunging movements with the ball when the students were expected to be still;
- jumped on the floor and attempted to tackle another student;
- made strange faces and odd body movements throughout the lesson;
- jumped up to leave the room before he was allowed to do that, and then rushed out of the room as if he was on a football field; and
- when returning to his table after instruction on the floor, he often crawled back to his table.

Some of Richard’s displays of non-verbal provocation were constant and persistent in very public ways. At other times he was so subtle and careful with what he did that the teacher did not notice his teasing. Unlike Tina and Renee, who often targeted the teacher in their teasing, Richard appeared to be very ‘teacher wise’ on these occasions, and to be disguising what he was doing. He monitored the teacher closely, and only took safe opportunities (while the teacher was at a distance) to provoke others. Richard’s teacher
reported that he was unpopular with most students, except for the members of his small group of male admirers.

**Renee, June and Janet**

Renee often teased other students when it was noisy. This included taking or withholding objects, physically hurting others, telling on them (Case Study Two, Chapter Eight). June, another older student, also demonstrated a ‘teacher-wise’ attitude when she broke class rules. Her teacher was particularly concerned about the way she tended to hurt other students. Videotape data support the contention that her teasing was more prevalent when noise levels were high. Janet was also seen to tease other students more when it was noisy; her preferred methods included pushing, prodding and grabbing. She also often threatened to, and actually did ‘tell on’ other students. During one lesson she reduced a male peer to tears with her threats to tell on him.

While these students are often involved in non-verbal teasing they also tease verbally, often blaming others or accusing them of various things. In this type of verbal interaction, there is little need for them to listen. Conferral of blame and accusative behaviour do not place heavy demands on listening skills. As with declarative statements, the need to listen is minimal. As is reported in the case studies and discussed in Chapter Eight, public accusations involve a low risk that hearing related communication problems will be discovered.

The response of other students to teasing by the target children varied. Some of the students were observed making complaints to the teacher, and the teachers said that students often complained about the behaviour of the target students (Richard, Tina, Renee, June, and Janet). On occasion, their
teasing and provocative socialising was seen to prompt a quite volatile peer response. For example:

Janet has been bouncing around, fidgeting and prodding another student. The student in front of Janet suddenly turns around and hits Janet on the forehead.

Teasing is not a successful strategy when used to try and establish positive social relationships. Further, as with ‘talking when quiet’, ‘teasing when noisy’ has adverse consequences. The target students’ were seen as having behaviour problems; teachers disciplined target students for teasing and peers often told their teacher about inappropriate behaviour by the target students.

However, ‘teasing when noisy’ is not a practice adopted by all the target students. Sean and Kirsty did not engage in this form of behaviour, although they showed evidence of learning difficulties related to their listening problems. Kirsty was identified as having hearing loss, but was definitely not a student with behaviour problems. Indeed, she was noteworthy for her attempts to comply with teachers’ wishes. Another student with hearing loss, Sean, exhibited no behaviour problems, despite the learning difficulties that were related to his hearing loss. The ESL teacher who was working with him described these and the benefits he gained from working with her one-on-one in a quiet environment.

I’ve been working with him (Sean) one to one over the last three weeks and he has really clicked quickly. Just having the one-on-one in a quiet environment has kicked him off. When I observed him in class he really was not coping with group instruction.
Modelling disruptive behaviour and avoiding teaching help

The behaviour of the target students was not only disruptive in itself. It sometimes served as a model for others to follow. This was particularly evident in the case of Richard.

- Richard reaches out and gives her a heavier tap, almost a punch. Students around him can be seen to be tapping the student next to them. Richard continues to tap the student in front. A teacher can be heard threatening one of the students around Richard to stop making silly noises. They are imitating Richard in what he does.

- After Janet has been twisting her skirt the girl sitting next to Janet gets up and starts twisting her skirt around. Someone starts wolf whistling and Janet starts pulling the girl’s skirt up.

The behaviour of the target students was observed to disturb others’ work and significant amounts of teacher time were spent on managing their behaviour. A similar finding was reported by this author in an earlier study (Howard, 1990). However, in contrast, in this study, the target students in these classrooms did not take up teacher time by demanding one-to-one help. Rather, they were observed engaging in attempts to avoid help from their teacher, even when they needed it. Richard was observed refusing help when it was offered and instead seeking help with the same work from a peer. Sam refused help with work he was having trouble with, and simply failed to finish it. These students attempted to maintain a degree of disengagement from their teacher, although they were in need of educational help.
School design and background noise

Noise levels at school depend primarily on the number of children, how they are managed and the spaces they occupy. However, there are aspects of school design that do contribute to levels of background noise.

- The library in one school had an air conditioning vent near the group instruction area.
  
  Observation of lesson in the library: Background noise from air-conditioning vent next to the group instruction area can be heard clearly. A target student with hearing loss is notable in moving around the group more than others. He moves around to get a better view of what is going on. At first he moves half way towards where the teacher is talking. Then he moves right to the front (Research notes).

- In another situation, an air conditioner vent near the door of one classroom created problems for the teacher using that classroom.
  
  Teacher: I can hear that air conditioning through the windows and doors. Every time someone comes through the door I virtually have to stop what I'm doing because the air conditioning is so noisy.
  
  Although the classroom had louvres that could be opened, she never did so because the noise level became too high.

- Another class had its lunch area outside an air conditioning vent.
  
  Recordings of the sound level in this area averaged 80 to 85 dB. The target student in this class was silent during lunch and eager to finish lunch and get away.
• The location of play equipment in one place creates a playground area where noise levels can be very high. Students who have problems with communication when background noise levels are high may avoid using this equipment. Spreading out the equipment could limit background noise and so make equipment more accessible to these students.

To summarise, most of the target students attempted to communicate verbally when they were expected to be quiet. The results suggest this was primarily because they were taking advantage of lower noise levels to communicate verbally with others (Tina, Robert, June, Renee, Alana, and Janet). The target students also sought to interact non-verbally with others, especially when background noise levels were high, by ‘teasing’ them. This teasing could involve ‘using bodies as social objects’, for example, poking, prodding, or hitting their peers (Richard, Tina, June, Renee). Alternatively, it could involve ‘socialising through objects’, for example, some students took things that the others wanted (Richard, Tina, Renee), or took materials that had been used in classroom activities (Renee, Janet). One student was observed destroying others’ work (Tina). These behaviours prompted complaints from their peers and intervention by their teacher.

‘Socialising through objects’ was most evident in the early childhood classes where there were more hands-on activities involving the use of different materials (Renee, Janet). It was also evident in some of the upper primary classes when the students were engaged in hands-on activities (Tina during science and art classes).

Two target children (Richard and Renee) were notable in that they often called out in response to comments their teacher made to the class as a whole, or to other students. This ‘public socialising’ might have occurred
because the students sought to respond to the only conversation that they could easily hear, when what was said was sufficiently loud for them to hear it over the background noise level in the class. While Renee responded only occasionally to the teachers’ comments to the whole class, Richard maintained a barrage of interjections. Teachers saw this ‘public socialising’ as disruptive. In Richard’s case it was highly disruptive, and a considerable amount of teacher time was spent in dealing with it. The disruptive behaviour of the target students was sometimes copied by other students.

As a general rule, these interventions by the target students, which appear related to the interaction between their hearing loss and background noise, were seen as behavioural problems.

Visual coping strategies seen as behaviour problems
Target students used visually monitoring strategies more than other students did. There is a description in Chapter Eight (Case Study Two) of the ways in which Renee appeared to observe classroom events more closely than her classroom peers. June displayed the same behaviour, and in so doing, was disciplined by her teacher for not paying attention – she appeared distracted. Richard often wandered through the classroom, both observing and provoking his peers. He too was disciplined for this behaviour. Other visual coping strategies were also observed. These too were likely to be perceived as non-compliant behaviour, according to the school rules. Examples from the videotape data include:

- Students who positioned themselves so they could visually monitor classroom events often moved around to do so, standing up, or pushing in front of their peers. This contravened the teachers’ expectations that students would stay put in one place.
and focus visually on either the teacher, or as directed by the teacher (Renee, Janet, and Tina).

- Students who positioned themselves close to the teacher, often in actual physical contact with the teacher, which meant that their way of monitoring other classroom events was easily noticed by their teachers (Renee, Janet). This was more evident among younger students. In contrast, Richard and June, both upper primary students, attempted to avoid contact with their teachers and kept a close eye on the focus of their teachers’ attention during class time.

As with the practice of ‘talking when quiet and teasing when noisy’, which teachers regarded as a ‘behaviour problem’, the visual coping strategies that students used to support their hearing could also result in teacher applied discipline. These strategies also irritated other students, who complained and sometimes retaliated.

**Peer help and behaviour problems**

A strategy used by the three older target students was to seek help from peers, often someone who was a special friend. Richard, Tina and June had ‘special friends’ who helped them in class. Tina’s teacher commented that if Tina’s special friend was absent from school she was almost unmanageable in class. Richard sought help from his friend when he had not understood teaching instructions. At times he was observed to refuse help from his teacher, then to seek out his friend to ask him, instead of the teacher, how to do the work. June also often sought help from her special friend. She mentioned ‘getting into trouble’ for seeking help from a friend so she could understand the teacher’s verbal instructions.
Interviewer: What do you do when you can’t hear properly?

Nothing, I ask my friend, but she [the teacher] says ‘June don’t talk’.

Interviewer: Do you get into trouble a lot for that?

June: Yeah.

As mentioned earlier in this chapter, June’s friend said that they sometimes also got into trouble for being late back to class. They were late because June liked to go to the furthest and quietest point on the school grounds, and from there it was difficult to hear the signal to return to class.

I have previously reported (Howard, 1994) on the tendency of some teachers to regard the use of peer learning strategies by Indigenous students as disruptive. During this study it became even more apparent that seeking help from friends was another coping strategy that could sometimes lead teachers to conclude that students had behaviour problems. One of the teachers interviewed for this study commented, ‘The problem with these (Indigenous) students is that they are just too interested in each other’. Attitudes such as this one can effectively turn what might be seen as a culturally-based educational asset (peer learning) into an educational deficit.

**Emotional reactions of students**

It is clear that teachers often viewed the methods the target students used to deal with some of their social problems as behaviour problems, and responded accordingly. While the emotional consequences of the teachers’ interventions for the students were seldom directly observable, there were some indications that the students had been affected emotionally by their social and learning difficulties. Some displayed ‘cranky’ or ‘sulky’ moods, and there was evidence that they were touchy about having work corrected
or when they were socially excluded. Moodiness is often seen as a contributing factor in social problems.

- Renee was described (by her teachers and parent) as moody, and her moods influenced the extent of her cooperation. When she seemed to be in a bad mood, she was also inclined to hurt other students.

- June was described by her teacher as sometimes moody and obstinate, and at times June would say she was going home and refuse to co-operate in class.

- When June hurt other students, her actions were ascribed to bad moods.

- June bit her nails, and looked anxious at times. At other times she looked upset and angry as she observed other students.

- Sam often looked withdrawn and anxious in class.

- Target students were observed to be particularly sensitive when they could not complete work.

- Renee became upset and ‘sulked’ when she was spoken to sternly by her teacher, after she had been disrupting a lesson for some time.

- Richard showed his sensitivity about not being able to do prescribed class work. When teasing other students he often accused them of ‘being dumb’.

- Richard said the work he had difficulty with was ‘dumb’.

- Tina reacted badly (snatching her work back) when a teacher corrected her work, and she appeared upset.

Not understanding instructions and behaviour problems

A recurrent theme, evident in many of the research notes, is that the children with hearing loss could not accurately perceive what was said to them. An
experienced ESL teacher who worked with two of the target students said that the students that were often disruptive in the classroom were not in her small class groups. She thought this might be because they were able to get one-to-one help in class, and work that was tailored to their abilities. In her opinion ‘If they know what to do they don’t muck up’.

Renee’s disruptive behaviour in class (Case Study Two, Chapter Eight) was often related to her difficulties in understanding verbal instructions or spoken information. Tina was heard to say, on several occasions, and in response to questions about how she was getting on with her work, that she did not know what to do. She was observed wandering about while her teacher was issuing instructions to the class, and focusing her attention on objects of various sorts, instead of on the instructions that were being given.

Only one student, one of the older ones, made a connection between his failure to understand instructions and his apparent behaviour problems. Richard, when asked why he had been sent outside the classroom, on one such occasion, said that ‘he had not understood instructions and then got into trouble’. This may have been a self-serving excuse, but it is in line with the comments made by other Indigenous students who have been excluded from school (Stehbens et al., 1999). Indigenous students who had been excluded from school in NSW often mentioned having trouble understanding the teacher, and it was the most commonly given reason when they were asked what had precipitated the behaviour that led to their exclusion. In previous research, (Howard, 2004) I also found an association between current hearing loss, difficulties when having to follow instructions, and disruptive behaviour at school.
Hearing loss and behaviour problems

The student responses that result from a combination of conductive hearing loss and background noise and can be seen as behaviour problems are summarised in Table 9.13.

Table 9.13 Target student social responses and their relationship to hearing loss

<table>
<thead>
<tr>
<th>Features of social response related to hearing loss and background noise</th>
<th>Hypothesised relationship to hearing loss</th>
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<tbody>
<tr>
<td>Talking when quiet in class</td>
<td>Takes opportunity to communicate verbally when background noise levels are lowest</td>
</tr>
<tr>
<td>Non-verbal teasing when noisy in class</td>
<td>Attempts to engage socially when verbal communication is difficult</td>
</tr>
<tr>
<td>Calling out</td>
<td>Responds to conversation that is loud enough to hear, generally the public comments of a teacher or other students</td>
</tr>
<tr>
<td>Visual compensation strategies</td>
<td>Visual scanning compensates for diminished auditory input</td>
</tr>
<tr>
<td>Seeking help from peers</td>
<td>Helps compensate for inability to hear teacher instructions</td>
</tr>
<tr>
<td>Difficulties in understanding teacher’s instructions</td>
<td>Difficulties with speech perception because of hearing loss, especially when it is noisy</td>
</tr>
</tbody>
</table>

Attempts to cope with instructional demands or remain socially engaged despite the obstacles created by hearing loss and background noise appear to result in behaviour that causes problems for some Indigenous children. The hypothesised relationships outlined in Table 9.12 are based on speculation about the students’ possible motivations. However, the actual motivations that guide their responses are unclear.

‘Teasing when noisy’ may occur:

- because the students need to feel they are socially engaged when their peers are also socially engaged, but are unable to manage verbal communication, or
they may be seeking to distract attention from their difficulties with verbal instructions, or
they may simply be choosing to entertain themselves when unable to deal with these difficulties.

‘Talking when quiet’ may occur:
because the students may be seizing the opportunity presented by lower noise levels to make up for the verbal social engagement that they could not manage when noise levels were higher, or
they could be seeking to divert attention from their difficulties in understanding verbal instructions.

It is probable, however, that each student will have different motivations, and that different motivations will be dominant at different times. At other times, there may be more than one motivating influence on their behaviour.

During the initial analysis of the research data, the primary reason and motivation for the behaviour of the students seemed to be their desire for social inclusion. However, there are now teachers who have received training based on the results of this research, and who have implemented some of the suggested class management strategies to try and address the classroom problems that arise from hearing loss. Feedback from some of these teachers suggests that a primary desire for social inclusion may not be the most significant influence on, and determinant of their behaviour. The teachers have reported that the ‘behaviour problems’ often diminish when they make sure that children with hearing loss are able to understand their instructions (by repeating them and using visual cues). The behaviour problems seem to diminish without any direct intervention in the classroom based social interaction between the students and their peers. This suggests
that the primary motivation of students with hearing loss, when they engage in disruptive behaviour, may be a wish to avoid apparent failure in the face of instructional demands that they do not understand, and not a need for social inclusion.

A secondary consideration here, however, is that when the students are able to understand what their teachers want, not only do their disruptive behaviours appear to change without further intervention, but also they are more likely to feel a sense of belonging, to the class ‘crowd’. As such, their needs for social inclusion in that class may be almost automatically addressed. If they understand what is expected of them, then they can work to meet those expectations. They are better able to learn through their own efforts, as individuals, and alongside their peers. When they can do so, they become a more integral part of the class group and are better able to participate in the learning centred social interactions that take place in their classroom. In this respect, their classroom and learning social needs are more easily satisfied.

In practical terms, however, children who have both a conductive hearing loss and who come from a minority and different linguistic and cultural background are more vulnerable than adults to the influence of background noise and the resulting problems with speech perception (Plant, 1995). This study indicates that problems with speech perception are just one of the effects of high levels of background noise in classrooms: social and behavioural problems are also influenced by background noise.

**Other reasons for the student behaviour**

Lastly, we should consider other possible explanations for the classroom responses observed among the target students. The number of children
involved makes idiopathic explanations (such, as ‘they all have ADHD’) of these behaviours unlikely. The visual coping strategies that were observed among the target students could relate to cultural issues. However, if this were so, the control students, most of whom were also Indigenous, should also display these coping strategies, and this was not the case. There may some out-of-school factor that influences both predisposition to ear disease and having behaviour problems. However, any such explanation would still need to explain why these behaviours were displayed selectively at different levels of background noise.

There do not appear to be other plausible explanations for the systematic patterns observed, other than that there is a relationship between children’s social responses, levels of background noise and conductive hearing loss.

To summarise, the following two patterns of responses were observed in the background noise studies and examination of distinctive classroom responses among the eight target students.

**Table 9.14  Two patterns of responses among 8 target students**

<table>
<thead>
<tr>
<th>Among six target students with current conductive hearing loss</th>
<th>Among two target students with conductive hearing loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Talked when it was quiet</td>
<td>• Talked little when it was quiet or noisy</td>
</tr>
<tr>
<td>• Teased when it was noisy</td>
<td>• Often isolated at school</td>
</tr>
<tr>
<td>• Used visual coping strategies</td>
<td>• Not seen as behaviour problem</td>
</tr>
<tr>
<td>• Used peer support strategies</td>
<td>• Displayed signs of anxiety</td>
</tr>
<tr>
<td>• Responses often seen as behaviour problems</td>
<td></td>
</tr>
<tr>
<td>• Displayed signs of anxiety</td>
<td></td>
</tr>
</tbody>
</table>
SECTION FOUR

RESULTS

Chapter Ten

Teacher identification of hearing loss
Chapter Ten

Teacher identification of hearing loss

It is essential that teachers know which students have a current hearing loss if they are to understand and appropriately respond to the type of social problems described in the last two chapters. Provision of services of all types to Indigenous children with hearing loss is constrained because it is difficult to identify the children who have a current hearing loss. This chapter describes two pilot studies that address this problem. Both are observational studies that focus on the identification of children with hearing loss. The first considers culturally-shaped differences in the way students pay attention that may confuse non-Indigenous teachers. The second evaluates a strategy that teachers can use to identify students with a current conductive hearing loss.

The first observational study was designed after it was noted that some of the target children watched the face of the person speaking to them to a greater extent than other Indigenous students. This was of interest because teachers often use attentiveness as an indicator of possible hearing loss. Within Western cultures, watching the face of the person speaking is usually seen as an indication that someone is paying good attention, but with Indigenous students it may instead be a sign that a student has an unrecognised hearing loss.

To test the proposition that Indigenous students with hearing loss watched the face of speakers more than other students, videotape recordings were made of students with and without hearing loss while they were engaged in
one-to-one conversation with their teacher. The percentage of time each student spent watching the face of the teacher during their conversation was then calculated, and the results for the students with and without hearing loss were compared.

The idea for the second observational study came from my prior experience of issues associated with the ability of schools to offer special services to students. This experience suggested that efforts to identify students with hearing loss are constrained by access to scarce and expensive audiological services. However, hearing loss must be identified before children can receive medical treatment, amplification equipment, or educational support. Further, the identification of hearing loss can prompt parents, teachers and others to engage in compensatory communication strategies, and to be more tolerant of the communicative difficulties of the affected children (Moore & Best, 1988).

An Indigenous health researcher, Ian Anderson, described what he called ‘critical gaps’ in knowledge of Indigenous health issues that inhibit service provision (personal communication, 2000). There are particular service provision issues that researchers must consider if there is to be any improvement in the provision of government services to Indigenous people. One of these ‘critical gaps’ is the identification of current hearing loss. A simple means by which teachers can accurately identify the students with a current hearing loss is needed. Without such a tool, teachers are limited in their ability to cater for the high proportion of Indigenous students with hearing loss while they are at school, and to refer them for formal assessment. To address this problem a classroom test game called ‘Blind Man’s Simon Says’ was developed, and then evaluated by comparing the
results from an evaluation of the test game with the results from the formal hearing screenings and assessments.

**Cultural masking of Indigenous children’s hearing loss**

Lowell (1994) described cultural differences in attentional style that included the degree of eye contact. This study gathered its data before the results of Lowell’s work were published, in 1994, but, as it happened, examined similar behaviour. Rather than eye contact, the relevant behaviour is more properly called face watching, since what is involved is watching the whole face, and especially the lips, as this can help the listener to gather information that compensates for their degraded auditory input. One target student in this study described what he did; he ‘watched people’s lips’ to get more information when he could not hear properly.

As outlined in Chapter Seven, to gather the data for the first of these two observational studies, teachers and students were asked to talk to each other. While the teachers conversed with nine students, individually their verbal interaction was videotaped. The teacher and the students were seated on chairs just outside the classroom in what was a relatively (for schools) quiet environment (a background noise level of between 60 to 70 dB). The nine students included three Indigenous students with no hearing loss, three Indigenous students with current hearing loss, and three non-Indigenous students with no hearing loss. The amount of time each student face watched during their conversation was recorded with a stopwatch. The percentage of time during the conversation that face watching was maintained was then calculated (Table 10.1).
Table 10.1  Face watching during one-to-one interaction

<table>
<thead>
<tr>
<th>Student</th>
<th>Total time of interaction (in seconds)</th>
<th>Time spent face watching (in seconds)</th>
<th>Percentage of total time spent face watching</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indigenous students: no current hearing loss</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S2</td>
<td>307 seconds</td>
<td>133 seconds</td>
<td>43 per cent</td>
</tr>
<tr>
<td>S5</td>
<td>441 seconds</td>
<td>96 seconds</td>
<td>21 per cent</td>
</tr>
<tr>
<td>S6</td>
<td>268 seconds</td>
<td>115 seconds</td>
<td>42 per cent</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Average: 35 per cent</td>
</tr>
<tr>
<td>Non-Indigenous students: no current hearing loss</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S1</td>
<td>271 seconds</td>
<td>217 seconds</td>
<td>80 per cent</td>
</tr>
<tr>
<td>S4</td>
<td>333 seconds</td>
<td>250 seconds</td>
<td>75 per cent</td>
</tr>
<tr>
<td>S8</td>
<td>414 seconds</td>
<td>290 seconds</td>
<td>70 per cent</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Average: 75 per cent</td>
</tr>
<tr>
<td>Indigenous students: current hearing loss</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S9</td>
<td>322 seconds</td>
<td>104 seconds</td>
<td>32 per cent</td>
</tr>
<tr>
<td>S7</td>
<td>310 seconds</td>
<td>239 seconds</td>
<td>77 per cent</td>
</tr>
<tr>
<td>S3</td>
<td>298 seconds</td>
<td>202 seconds</td>
<td>67 per cent</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Average: 58 per cent</td>
</tr>
</tbody>
</table>

The three Indigenous students without hearing loss spent approximately half as much time face watching as the three non-Indigenous students with no hearing loss. This suggests that the culturally-shaped differences identified by Lowell (1994) among some Indigenous students in remote communities are also evident among the urban Indigenous students in this study.
Two of the three Indigenous students with hearing loss face watched for a similar length of time to the three non-Indigenous students without hearing loss. In this respect, their compensatory visual communication strategies appear to resemble the culturally-shaped attentiveness style of non-Indigenous students. This has important implications for non-Indigenous teachers in helping them to accurately identify the Indigenous children who have a current hearing loss. It means that Indigenous students with hearing loss may have an attentional style that is similar to that of non-Indigenous students with no hearing loss. This highlights the need for methods that do not rely on classroom attention to help teachers identify the Indigenous students with hearing loss.

**Teachers need to know who has a hearing loss**

Identification of hearing loss is necessary if a child is to be included in school programs that may address their needs. Further, identification of hearing loss may be one of the mitigating factors that serve to protect a child against the otherwise adverse social and educational consequences of conductive hearing loss. Teachers and parents are likely to respond to and manage children differently when they know have a hearing loss.

The comments of one mother in this study provide evidence that this is the case:

> Before I knew [she had a hearing loss] I would ask her to do something and she would just sit there and I would get angry and send her to her room. But now we know, we go closer to talk to her and talk louder. Now the family knows, they do the same thing too. They used to get upset with her too when she didn’t do something she was told to. So it works out pretty well. (Mother of June.)
Problems in formal identification of hearing loss

Formal identification of a child’s hearing loss often occurs only when children are tested as part of a hearing screening program and referred for a full hearing assessment. Since conductive hearing loss fluctuates, regular screening is needed to identify the children who have this problem. One of the NAHS (National Aboriginal Health Strategy Working Party, 1989) goals was that every Australian Aboriginal child should have access to at least an annual hearing assessment by 1991. That goal has still not been achieved. McPherson (1995) reported that the states with large Indigenous populations (Queensland, Northern Territory and Western Australia) had screening programs but that these mostly operated in non-urban areas, and that there were no large-scale programs for the screening of urban Indigenous children. This is despite the fact that at that time 67 per cent of Indigenous children lived in urban areas (Australia Bureau Statistics, 1993) and their rates of hearing loss were reported to be between 16.5 per cent (Kelly & Weeks, 1991) and 36 per cent (Nienhuys, 1994). In the non-rural parts of Australia, screening occurs occasionally, if an individual professional or community has a particular interest in the subject.

McPherson (1995) suggested that this apparent neglect of the hearing of Indigenous children in urban areas is related to:

- the fact that the prevailing research has focused on rural populations where mass screening is easier because the target Indigenous population group is congregated together, while in urban areas Indigenous children are scattered through the mainstream population;
- the fact that screening is more cost-effective when target groups are found as congregations of a few large groups rather than a scattering of many small groups; and
• the fact that the problem of the high incidence of hearing loss is more visible in places where the clients of the health services are mostly Indigenous people.

However, screening programs need trained staff and equipment. It is often difficult for health staff to find the time for hearing screening, and especially so when middle ear disease, which leads to conductive hearing loss, is seen as a relatively minor health problem in comparison with the range of other more significant Indigenous health problems. Thus, to be aware that a child has a hearing loss, teachers and parents generally depend on their access to the services of health professionals, for whom the issue is often not a high priority.

The identification of Indigenous children’s hearing loss is likely to continue to be problematic while it remains largely reliant on hearing screenings carried out by health professionals. Moreover, at least in the Northern Territory, these professionals seldom have the training, reliable equipment and, above all, the time needed to conduct regular hearing screening programs. As a result, there is an obvious need for simple, reliable methods that those most concerned with the consequences of Indigenous hearing loss (parents and teachers) can use to check the hearing of children who may be affected by it.

**Informal speech reception testing**

One method that might be used to identify students with a hearing loss was put forward by Peter Strong, an adviser on deafness from New Zealand who was working in the Northern Territory during the 1990s. He suggested using an informal speech reception test adapted from a test sometimes used by audiologists (the Kendal Toy Test). The test checked the ability of a subject to
respond consistently to verbal instructions given in a quiet voice. While this informal test seems to hold some promise as a means of identifying students who are likely to have a significant hearing loss in both ears, it has the disadvantage that it must be administered individually, and each test involves two adults, as well as the student.

As part of this research project, attempts were made to overcome these difficulties by further adapting the Kendal Toy Test. This resulted in the development of a game called ‘Blind Man’s Simon Says’. The game involves a group of no more than five children who stand at the front of a room with their eyes shut. An adult standing at the back of the room asks them, in a quiet voice, to put their hands on different parts of their body (details of this game are given in Appendix One). This test can be used repetitively to quickly test whole class groups, and can be carried out by a single adult.

**Results**

The informal hearing test ‘Blind Man’s Simon Says’ was trialled at a Darwin school where the hearing of Indigenous students was also being formally tested as part of a Northern Territory hearing program. The formal testing program involved initial screening of student hearing (1000 and 4000 Hz at 20 dB). Any students who failed this screening test were given a full hearing test using pure tone audiometry and tympanometry in a sound-proof booth.

Before the screening tests were carried out, all the students who were being screened were videotaped playing ‘Blind Man’s Simon Says’. A teacher, who did not know any of the children that had been tested using this game, was then employed to review the videotape. She identified the children that might have a hearing loss on the basis of the particular behaviour they exhibited during the game (mostly evidence that they were having difficulty
following the instructions, or appeared reluctant to play the game - see Appendix One). Her results were then compared with the results of the audiometric screening and full audiometric assessment. The data are presented in Table 10.2.

Table 10.2  Comparison of the results of the speech reception game ‘Blind Man’s Simon Says’ with the results of the formal hearing assessments in identifying students with current bilateral conductive hearing loss

<table>
<thead>
<tr>
<th>Identified by ‘Blind Mans Simon Says’ as having a hearing loss in both ears</th>
<th>Passed by Formal Hearing Assessment</th>
</tr>
</thead>
</table>
| Identified by ‘Blind Mans Simon Says’ as having a hearing loss in both ears | 17  
False positives |
| Passed by ‘Blind Man’s Simon Says’ | 1  
False negative |
| | 21 |

These results indicate that the informal speech reception test ‘Blind Man’s Simon Says’ correctly identified seventeen of the eighteen students who were found by screening and full hearing tests to have a hearing loss in both ears. The one student who was a false negative was found to have a mild hearing loss in both ears (average 29 dB left ear, average 27 dB right ear). This student’s hearing loss appeared to have been ‘masked’ in the speech reception game because he was in a group with other students who had more severe levels of hearing loss.
Specificity and Sensitivity

The effectiveness or validity of a test is described in terms of specificity and sensitivity. Sensitivity refers to the accuracy of the test in identifying those with a current hearing loss: few false negatives. Sensitivity is usually the more critical element in screening tests (Roeser & Downs, 1988). The practical consequence of poor specificity is that the test will not identify a significant number of students with a current hearing loss. If they are not identified these children can not be treated medically or supported educationally. However, with this test, poor specificity, while still a concern, is of limited significance in relation to the children’s potential access to the services they need. This is because the only consequence of poor specificity in this case is the inclusion in the group of students in need of further hearing tests some students who will be later found to not have a hearing loss. Thus, poor specificity may result in the unnecessary allocation of some of the resources needed to formally test the hearing of those in the group.

In contrast, poor sensitivity would mean that many students who need additional services and support would be excluded from the group of students who need more formal hearing tests. In other words, it is better to include children who do not have a hearing problem than it is to exclude children who do have a hearing problem. Specificity and sensitivity scores (calculated according to Roeser & Downs, 1988) for 'Blind Man’s Simon Says' are as follows:

- **Sensitivity:** 94 per cent of children with a current hearing loss were accurately identified by this test.

- **Specificity:** 75 per cent of students without a current a hearing loss were accurately excluded by this test.
One limitation of the study is that the test game was led by the researcher, who has had experience in giving quiet verbal instructions, but not whispering while doing so. Attempts to train others in this technique have shown that it is a skill that can take some time to master. This means that the results of the test may be less accurate if it is conducted by someone without training or experience in using the technique.

**Summary**

The identification of students with a current hearing loss is an essential initial first step towards the delivery of appropriate services to children affected by hearing loss. This chapter described the results of two pilot studies that explored issues associated with the identification of these children. The first study identified cultural differences in attentional style as an obstacle to the identification, by non-Indigenous teachers, of Indigenous students with hearing loss. Indigenous students with hearing loss, who tend to ‘face watch’ as much as non-Indigenous students with no hearing loss, are likely to confuse teachers who use attentiveness as a way of identifying Indigenous students with current hearing loss.

The second pilot study evaluated a strategy to overcome this problem and help teachers to identify the students with a current hearing loss. Ninety four per cent of students with a current hearing loss were accurately identified by the hearing test game ‘Blind Man’s Simon Says’. The game accurately identified all but one of the students with current hearing loss and three-quarters of the students with no current hearing loss.

The next chapter discusses these results, and the results presented in earlier chapters.
SECTION FIVE
DISCUSSION AND
CONCLUSION

Chapter Eleven
Summary, discussion and directions
Chapter Eleven

Summary, discussion and directions

Summary

Indigenous people experience disadvantage in a wide variety of ways. One of these is the disadvantage they face in the education system and the effect this has on educational outcomes for many. The explanations put forward for this disadvantage include cultural differences that undermine learning opportunities, economic disadvantage, and the history of dispossession and continuing oppression that operate on macro and micro levels. The pervasive socio-economic disadvantage that affects Indigenous people also contributes to the extent to which they experience the early and persistent middle ear disease that causes conductive hearing loss. Indigenous educational theory and practice have given little consideration to the extent to which widespread conductive hearing loss may contribute to educational and social disadvantage. This study has explored the known association between conductive hearing loss and school behaviour problems; what is the nature of this association and how does it affect the behaviour of many Indigenous students.

When the data for this thesis were first collected the proposition that the social effects of conductive hearing loss might be educationally important had been little considered, and the possibility of this was not generally accepted. It was widely assumed that any educational disadvantage that did arise as a result of conductive hearing loss could be attributed to the diminished school learning opportunities for the affected children: ‘can’t-hear-the-teacher-so-can’t-learn’. However, the results of the recent West Australian Aboriginal Child Health Survey (Zubrick et al., 2006) give
prominence to the implications of the social and emotional outcomes of hearing loss. This large scale survey found that conductive hearing loss is associated with poor social and emotional outcomes, which in turn are associated with poor educational outcomes. The results of this study, which focused on eight Indigenous students with current conductive hearing loss in urban schools in Darwin, help to explain the nature of these associations and how conductive hearing loss can affect social and emotional outcomes. Because the research focussed on essential elements of communication, the results are as relevant today as when the data were collected in the 90s.

**Understanding school behaviour problems**

There is a strong professional expectation that teachers will maintain control in the classroom. This control depends on the acquiescence of students; they must be quiet in class and follow the directions of their teacher. Student responses that contravene these expectations quickly come to the attention of teachers. In this study, six students with conductive hearing loss displayed four characteristic types of classroom response that their teachers tended to view as a behavioural problem. The first three can be related to the actual hearing loss and the level of background noise. The fourth is related to the children’s use of visual strategies to compensate for their difficulties with verbal communication. These four types of classroom response, and their relationship with the underlying hearing loss, are described below.

**Talking when quiet**

Six of the eight target students with current conductive hearing loss were observed to talk more when it was quiet in class. However, these quieter times are generally times when the teacher is actually teaching, or when other students are working silently. Students who speak at these times contravene classroom rules and teachers tend to view this behaviour as
disruptive. It was apparent that it was more difficult for students with conductive hearing loss to listen to, and participate in verbal communication when the levels of background noise were higher in their classroom. The strategy of talking when the classroom is quiet may evolve because the students seize opportunities to communicate verbally during the best ‘listening’ conditions in the classroom. Alternatively they may talk at these times because their hearing loss can make it difficult for them to understand teaching instructions; they are sometimes trying to find out what they should be doing, or they may be bored and seeking to entertain themselves because they can not hear properly.

**Teasing when noisy**

Verbal and non-verbal teasing was more evident among most of the students with conductive hearing loss as classroom noise levels rose. It is noisier in class when children are permitted to talk, and most are doing so. The students with hearing loss may tease others at these times to disguise their listening difficulties, to entertain themselves when confronted by the effect of those listening difficulties, or to try and overcome the social and learning exclusion that they experience because of their listening difficulties. However, whatever the reason for this type of behaviour, the practical reality is that some children respond dynamically to the difficulties that they can experience with verbal participation in a difficult listening environment.

The non-verbal teasing of some students with conductive hearing loss involved attempts to socialise through the use of objects; for example, taking things, monopolising class materials, or sometimes damaging others’ work. One advantage of using objects as a socially connective tool is that doing so adds a greater degree of predicability to the topic of any associated verbal discourse. It is more likely that the students will understand any related
comments, and therefore be less exposed to the risk that they may not understand what the others are talking about. Some of the students also sought to socialise with others by prodding, poking and sometimes hitting them. However, while these responses do involve social contact, they are not positive social interactions. Instead, teachers and peers tend to regard these types of behaviour as unwelcome and disruptive.

**Calling out**

Some students were observed to call out after teachers or other students in the class had made loud and easily heard comments. By responding to the verbal signals in class that were the easiest for them to hear, the students with hearing loss were able to participate in at least some of the classroom verbal interaction. They could do so in this way when, for them, verbal participation during interaction in small groups was too hard, because of the compounded difficulties created by their hearing loss and background noise. By calling out at these times, the students may feel that they are taking advantage of the opportunities available to them in class to join in some of the conversation, although such interventions are generally unwelcome ones from the perspective of teachers and peers.

**Visual observation strategies**

Visual observation strategies help people to compensate for any difficulties in accessing auditory input because of hearing loss and/or background noise. The students in this study used visual observation strategies that included looking around the class more than their peers did, standing up to see over the heads of those sitting down, pushing in front of peers, or moving around to get a better view. These responses were likely, however, to be seen by others as ‘pushing in’ and ‘moving around without permission’, or even as hyperactive behaviour. Students who acted in these ways often drew
attention to themselves in the classroom; they were behaving differently while their teachers were intent on maintaining uniformity in the behaviour of the students.

**Peer relationships**
Other responses that were not seen as behaviour problems but contributed to poor relationships with classroom peers. Target students were observed to dominate conversations, ignoring comments from others. Dominating conversations is one way of disguising difficulties that are experienced listening to others. ‘Telling tales’ to the teacher was also a common response of some target students. Using visual monitoring as a coping strategy heightens students’ awareness of when others are contravening school rules. Telling the teacher about other students’ behaviour appears to be a socially dysfunctional use of information gained through visual monitoring. Target students were described as often ‘moody or sulky’ and as being sensitive to peer rejection.

**Outside the classroom**
For the students in this study, hearing-loss-related listening problems and their responses to these when confronted with the effects of background noise were not confined to the classroom. Interviews with the students produced information that highlighted the problems that students with hearing loss can face when dealing with background noise elsewhere in school. It is generally assumed that students have the opportunity to socialise freely in the playground during break times. Comments by students in this study suggest that, for children with hearing loss, this is often not the case. Hearing loss and high levels of background noise combined to restrict verbal communication opportunities on the playground for these students, just as much as they did in classrooms. The high levels of background noise around
co-located play equipment and during group games inhibited verbal communication for some of the target students. The existing literature on school acoustics focuses almost solely on the classroom environment. Clearly, these results indicate that the focus of attention should be widened, to include other places in schools.

It is not surprising that, taken together, these responses give rise to situations in which many students with conductive hearing loss are judged to have behaviour problems. The ways in which teachers respond to undesirable student behaviour are informed by the ‘meaning-perspective’ (Erickson, 1986) that they hold about a particular ‘difficult’ pattern of behaviour. Moreover, if the pattern is repeated and the repetition is viewed as purposeful defiance, it may be met with sanctions. If the behaviour continues, students may be excluded from school, in accordance with the socially constructed perspectives (Lincoln & Guba, 1985) that shape responses to the management of unacceptable behaviour. A cycle of educational disadvantage is thereby begun.

This research provides information that can help with the construction of alternative ‘meaning-perspectives’ for some seemingly inappropriate student behaviour in the classroom. The results challenge the view that some children’s responses represent defiance, in the face of classroom rules and the authority of the teacher. An alternative ‘meaning-perspective’ is that for some students with conductive hearing loss they represent attempts to cope despite the difficulties they have when listening in noisy classrooms.

The West Australian Aboriginal Child Health Survey (Zubrick et al., 2006) has provided evidence that the responses described in this study are consistent with those found among many Indigenous children with a history
of severe middle ear disease. The Indigenous children with a history of middle ear disease were found to be more likely to have clinically significant social and emotional problems that were similar to those described in this study. Table 11.1 compares the results from this study with the West Australian survey results.

Table 11.1  Comparison of results from WAACHS and this study

<table>
<thead>
<tr>
<th>Social and emotional problems associated with conductive hearing loss found in Western Australia (Zubrick et al., 2006)</th>
<th>Social responses displayed by students with conductive hearing loss in this study</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Hyperactivity</td>
<td>• Wandering around</td>
</tr>
<tr>
<td></td>
<td>• Visual monitoring</td>
</tr>
<tr>
<td>• Conduct problems</td>
<td>• Disruptive in class</td>
</tr>
<tr>
<td></td>
<td>• Talking more when it is quiet in class</td>
</tr>
<tr>
<td></td>
<td>• Teasing when it is noisy</td>
</tr>
<tr>
<td></td>
<td>• Calling out in class</td>
</tr>
<tr>
<td>• Problems with pro-social behaviour (maintaining harmonious social relations)</td>
<td>• Problems with social inclusion</td>
</tr>
<tr>
<td>• Problems with peers</td>
<td>• Dominating conversations</td>
</tr>
<tr>
<td></td>
<td>• Telling tales</td>
</tr>
<tr>
<td></td>
<td>• Provoking others</td>
</tr>
<tr>
<td></td>
<td>• Teasing</td>
</tr>
<tr>
<td>• Emotional symptoms</td>
<td>• Sensitive to and upset by others’ responses to them</td>
</tr>
<tr>
<td></td>
<td>• Often moody or sulky</td>
</tr>
</tbody>
</table>

The West Australian survey results (Zubrick et al., 2006) support the reliability and the validity of the results from this study. Moreover, the results from this study help to explain the nature of the relationship between conductive hearing loss and the poor social and emotional outcomes that some children with conductive hearing loss experience while in the education system. They also point to the importance of high levels of
background noise and the beliefs of teachers about the reasons for particular student responses for the ‘construction’ of conduct problems associated with conductive hearing loss. These factors mediate the adverse social and emotional outcomes from conductive hearing loss.

**Managing behaviour in different ways**

The behaviour management strategies employed by teachers in response to the behaviours described above often served to exacerbate the social exclusion of the students and make it even more difficult for them to cope. The students were often removed from proximity to students with whom they tried to engage in various forms of communication. While doing this may ‘solve’ the problem as far as the teacher and other students are concerned, it compounds the social exclusion that the affected students already experience because of their conductive hearing loss and inability to cope with background noise. This suggests that there is a need for more effective behaviour management strategies to deal with the behaviour of students with conductive hearing loss; strategies that resolve their behaviour problems by helping to meet their instructional and social needs. Some of these strategies are described in the rest of this chapter.

One such strategy would be to foster the ability of these students observed during the study to make use of visual learning strategies. For example, in one classroom students were seated in a semi-circle and this provided them with opportunities for maximum visual as well as auditory input. This appeared to reduce the extent to which the attention of the students seemed distracted in class, as they did not need to twist around to visually monitor activity elsewhere in the classroom.
Another important influence on the management and prevention of behaviour problems with students with conductive hearing loss is the background noise level in a classroom. Factors that influence background noise in schools include:

- the number of students in a classroom;
- the design of the space they occupy; and
- the social organisation in the classroom.

Social organisation includes teaching styles. For example, some teachers insisted on quiet before they spoke, and then sat close to the students, the result was a good signal-to-noise ratio, even when the teacher was speaking quietly. In other classrooms, the teachers accepted consistently high levels of background noise and presented information and issued instructions by talking over the general hubbub.

Certain modes of classroom organisation were observed to minimise background noise levels. For example, by not having all the students doing the same thing at the same time it is possible to avoid the polarity of noisy/quiet patterns of background noise. In one class the teacher would organise the class into small groups working on different things at any one time, and the students then moved from activity to activity during the lesson. These were alternatively ‘quiet’ or ‘noisy’ activities, so that there was less noise intrusion from the surrounding work groups when children needed to talk as a group about a particular activity.

**School acoustics**

While the major findings of this study relate to the background noise generated by social activity, issues associated with the background noise that
are related to school design or generated by the use of a particular space were also evident. Some specific instances of this included the following.

- The poor positioning of an air-conditioning vent close to a door created noise intrusion problems every time the door was opened.
- The group instruction area in the library was next to a noisy air-conditioning vent, and this inhibited the capacity of some students to participate in the lesson.
- The area that students used when they ate their lunch was next to an air-conditioning vent and this constrained the ability of some students to engage in conversation at a time when lunchtime activities were being planned.
- The concentration of playground equipment in particular areas created problems with verbal communication for children with conductive hearing loss.

There is information available on appropriate school design to minimise the extent of external noise intrusion in classrooms, and reduce the noise created by the physical features of a classroom (Scott, 1999). Minimising noise and reverberation in existing buildings involves the careful selection and placement of equipment such as air conditioners, and covering hard and glossy surfaces with soft, sound-absorbent materials. It is important that teachers involved in Indigenous education and architects who design spaces used by Indigenous people have an understanding of these technical issues. The teachers and senior staff involved in this study were mostly unaware of the difficulties some children experience in noisy school settings or knew how to minimise noise.

The ongoing nature of this problem is illustrated by a recently completed purpose built training facility in a remote community (Howard, 2005). The
Training facility was a single large room with mainly flat hard surfaces. The room was most commonly used for concurrently held one-to-one or small group training sessions, and not for large group training sessions. The noise from adjacent conversations reverberated around the room and intruded on the individual sessions, making this a difficult learning environment for the 50 per cent of trainees with listening difficulties who were among those using it (Howard, 2005).

**Teacher training & evaluation of results**

When students display responses that are seen as behaviour problems, these diminish their long-term access to teaching assistance. Teachers are generally unwilling to work with students who exhibit disruptive behaviours, and when students are aggressive, these behaviours have been found to have a negative effect on the extent to which teachers interact with them (Patterson, 1986; Shores et al., 1993). Malin (1989) found that teachers respond to Indigenous students who appear to have different social expectations and/or do not comply with the expectations of the teacher with subtle types of disengagement, thereby diminishing the students’ access to the teacher’s time, support and approval. It is the Indigenous students with conductive hearing loss who are most likely to be seen as disruptive by teachers (Howard, 2004).

The educational disadvantage associated with the conductive hearing loss of Indigenous students is often conditioned by the ways in which teachers habitually respond to ‘uncooperative students’. It is important, therefore, to reframe the way teachers think about the student behaviours that are associated with hearing loss. Instead of being seen as non-compliant and anti-social, the behaviours can be seen as alternative, albeit often dysfunctional attempts to cope.
The information from this study has been useful in the development of training programs that have helped to reframe the attitudes of teachers and to give them information and skills that they can draw on to communicate with and manage students with conductive hearing loss. In particular, I have developed a teacher training program and resource materials (The Ear Troubles Kit) based on the findings from this study (Howard, 2003). The training program teaches teachers:

- that conductive hearing loss fluctuates;
- how to improve classroom acoustic environments;
- that one-to-one communication may be more effective with some children with conductive hearing loss; and
- that conductive hearing loss, when combined with high levels of background noise in schools, may cause students to:
  - behave in disruptive ways in class,
  - have difficulty with understanding verbal instructions,
  - talk more when it is quiet in class,
  - tease others when it is noisy in class,
  - call out in class,
  - tell tales about others,
  - prefer visual learning strategies, and
  - wander around.

Peers (teachers of the Deaf and hard of hearing and experts in Indigenous education) provided supportive feedback on the content of the training program (Chapter Seven). As part of an informal evaluation of the effectiveness of the training a number of the teachers who had participated in the training agreed to be interviewed a month after their training session. The following response from one teacher is typical of the results from these interviews.
The teacher reported that, after the hearing status of her students had been tested, it was evident to her that the patterns of behaviour described during the training were also evident among the students with current conductive hearing loss in her class. When asked how she had applied the training and information from the hearing test information in her class, she said that she had begun by making changes to improve the acoustics in the classroom. Carpet squares were laid and the walls were covered, to reduce reverberation. She also said that the training had helped her to understand that children with hearing loss can tire quickly because listening is such an effort for them. This encouraged her to plan her school day so that it included regular ‘listening breaks’, when the children were involved in activities (such as handwriting) that did not involve listening demands. She felt that these changes had helped to make her teaching more effective at the times when she needed the children to respond to verbally presented information.

This teacher also said that one of the most important outcomes of the training for her was that she was now much more aware of the level of background noise when talking to students, and more proactive in managing the levels of background noise in class. This was especially so when she wanted students to be able to listen to what she was saying.

I know that even if I can cope [be able to listen] despite the background noise they [children with current conductive hearing loss] may not be able to. And when I can’t they definitely can’t. (Class Teacher)

She said that after implementing the changes she found she spent much less time on the management of disruptive behaviour and more time actually
teaching, and especially giving individual support to students, or working with small groups.

I know the kids a lot better now. I am not wasting time on [managing] behaviour, I am actually teaching a lot more. (Class Teacher)

This teacher was asked to quantify the actual reduction in behaviour problems in class following the implementation of the changes she had made. She rated the level of disruption in class before the changes at eight to nine on a ten-point scale. When interviewed about the results she had achieved, she said the equivalent rating was now two to three. When asked to quantify the associated changes in students’ engagement with the learning process and time spent ‘on task’, she said that before she implemented the new approach, she would have rated this as a score of three on a ten-point scale. Afterwards, the equivalent score would have been six to seven out of then. She commented:

I had not realized how little they were on-task until we did this and I saw how much on-task they could be. (Class Teacher)

She also commented on a notable improvement in her enjoyment of her teaching and reduced levels of stress.

I loved it, I felt like I was a better teacher. I had a sense of [greater] satisfaction [in teaching] without constantly feeling I had to be an octopus to reach all the targets I should be. (Class Teacher)

She reported that her sense of greater effectiveness and improved classroom management resulted in a reduction in her experience of work related stress.

275
She rated her stress levels before she implemented changes as six on a ten-point scale, and subsequently, as two to three.

I have more dialogue [with students] now on learning and less on behaviour management… I feel we have a happier class environment.
There is more positive class participation and [I provide] more individual attention. (Class Teacher)

Relevance of results with non-Indigenous students
Research among non-Indigenous children with hearing loss has indicated that their behaviour problems are often very similar to those encountered in this study. For example, Moore and Best (1980) found that 90 per cent of non-Indigenous early childhood students identified as having behaviour problems also had a current hearing loss or abnormal middle ear function. The teachers of these children reported their involvement in bullying and fighting, and that they were disliked by other children.

My work as a psychologist has given me the opportunity to ‘test’ the applicability of the results of this study with non-Indigenous students. The following case study describes an instance of this.

Alex was a non-Indigenous student referred by his parents to a psychologist because teachers were concerned about his behaviour. His teacher was concerned that he was often disruptive in class, bullied other students and completed little work. He was often in trouble for talking in class and for teasing others, as well as for wandering around in class. Standard behaviour management strategies of ‘time out’ (being sent out of the class for a time after unacceptable behaviour) and a communication book (a book that his
teacher filled in each day and that he took home to inform his parents of his behaviour at school) were not working. His school suggested he be taken to see a psychologist. While discussing Alex’s health history his parents said that Alex had experienced persistent middle ear disease since early childhood. He regularly visited an Ear, Nose and Throat specialist, often experienced hearing loss, and had an unhealed perforation in one ear drum.

It was suggested that instead of counselling Alex about his behaviour at school a training program could be offered to his teacher. The training program conducted was similar to that outlined above. After one month the teacher was contacted again and asked if this different management regime had worked.

She firstly reported a change in her attitude to Alex. She had earlier reached the stage where she actively disliked Alex and felt he was purposely and maliciously defiant in class. However, understanding his behaviour problems and their association with conductive hearing loss had helped to change the way she felt about him – it had affected the ‘meaning-perspective’ she held about his behaviour. She described she now liked him more as a person.

The strategies she described consciously employing were providing extra one-to-one instruction to Alex and managing class noise levels more actively, especially when giving instructions. She also now allowed Alex a limited amount of ‘wandering time’ to observe others, before he was expected to get down to work.
She was asked to rate several variables in terms of ‘before and after’ the training she had received. An examination of her ratings indicated that in her view Alex’s behavioural problems had dropped by two-thirds. The degree that he was engaged in learning had doubled, and her stress levels had halved.

Alex was also asked how things were for him ‘before and after’ the training. He said that before the training he used to get into ‘heaps’ of trouble for bullying and teasing in class and being arrogant. When asked how he had been arrogant, he said that his teacher had said he was arrogant for not listening to her. He said he also got into trouble for talking and for interrupting others. He said school was often boring and he often thought he knew what to do but then found out he didn’t. He also said he would get into trouble for asking for things to be repeated too much.

He said that after his teacher did the training ‘he got to play outside’. He said that before he was often in detention at break times and not allowed to play outside. Now he did not get detentions and was able to play outside. He also said he had made more friends after he stopped getting into trouble in class. He said he was able to finish his work more often and could concentrate more easily. He also said he was not so worried now. Before he used to worry a lot that he would not know what to do; now he did not worry so much about that.

Alex’s teacher had acquired a new ‘meaning-perspective’ about Alex and his behaviour. This change was instrumental in helping her to change the dynamics of the social interaction that was taking place between Alex and her in a mutually beneficial way. There have been similar responses from
other teachers in other schools in situations that also involved non-Indigenous students.

**Long term outcomes of school social problems**

The experience of many classroom peers, during interaction with some of the target children in this study, was that they were teased, their possessions were taken, they were denied access to classroom materials, and they were often pushed, prodded and poked. Further, their comments in conversation were often ignored or misunderstood, they were ‘bossed around’ and told what they should be doing, and also ‘told on’ to the teacher. It was not surprising, therefore, that many target students were often not liked by their peers.

Social problems in childhood are likely to result in problems in later social and psychological adjustment. Levine (1966) found that the quality of the interpersonal relations that children establish with their peers during their school years is linked to their later success outside school. Furthermore, problems in relating to peers in childhood have been found to be associated with psychological difficulties during adolescence (Brown, Bhrolchain & Harris, 1975; Miller & Ingham, 1976; Parker & Asher, 1987). It is suggested that the single best childhood predictor of adult adaptation is the adequacy with which the child gets along with other children. Children who are generally disliked, who are aggressive and disruptive, who are unable to sustain close relationships with other children, or who can not establish a place for themselves in the peer culture, are seriously at risk of problems in adulthood (Hartup, 1992). Children who are rejected by peers report loneliness and social dissatisfaction (Asher & Wheeler, 1985), have more difficulties learning (Amidon & Hoffman, 1965), and are at risk of adjustment problems such as dropping out of high school, juvenile delinquency, and
mental health problems in adulthood (Parker & Asher, 1987). Programs to minimise adverse social outcomes that are related to conductive hearing loss should be a priority for teachers and schools. This proposition is supported by the very high proportion of Indigenous prison inmates with hearing loss (Murray, La Page & Butler, 2004)

**Compliance, social isolation and emotional adjustment**

Although most of the target students demonstrated the above-mentioned classroom responses that were likely to be seen as behaviour problems, two target students did not. These students were more socially isolated than the other target students, or any of the other students in their classes.

It may be that when faced with the ‘forced choice’ of either breaking school rules or social isolation, they ‘chose’ social isolation rather than risk peer rejection and teacher admonition. If so, this placed these students in a difficult predicament, and one of which their teachers were unaware. The social isolation of these students did not come to the notice of their teachers. While social responses that contravene classroom expectations were soon noticed, social responses typified by quiet compliance, social isolation and anxiety are unlikely to be evident to, or reported by teachers.

Moore and Best (1980) and Bennett and Haggard (1999) reported that parents, but not teachers, identified anxiety among students with a history of conductive hearing loss. Since these responses are less ‘visible’ to teachers, teachers need to be more aware of students with hearing loss who are highly compliant and socially isolated at school. Vernon-Feagans et al. (1996) agree that social isolation is associated with conductive hearing loss for some students. They found children with chronic otitis media in the first three years of life played alone more often and had fewer verbal interactions with
their peers than did other children. Bennett and Haggard (1999) also reported that students with a history of CHL were seen by their parents, but not by their teachers, to demonstrate neurotic behaviours.

Stenton (2004) suggests that females with a history of middle ear disease are more likely to experience lack confidence and anxiety that influences social interaction. While the numbers in this study were two small to explore this proposition, it is an important area for future research to explore.

This study has only minimally explored the psychological states and emotional reactions that are related to the described social problems. Some target students were observed as appearing anxious and their teachers reported that they were over sensitive to social rejection and could often be ‘moody’ or ‘sulky’. This, together with student concern about any social exclusion and sensitivity to correction, suggests that some emotional problems can be expected with conductive hearing loss. The associated negative social outcomes could be expected to contribute to poor self-esteem, and problems with emotional development and adjustment (Zubrick et al., 2006).

This highlights the importance of strategies that help students to build more positive social relationships and to resolve any behaviour problems associated with conductive hearing loss more effectively.

The identification of Indigenous children with hearing loss

If schools and teachers are to be responsive to the problems associated with conductive hearing loss, they must first know which of the children have a current hearing loss. Strategies are needed to deal with this problem, in part
because of the cultural differences in attentional style which constrain the ability of non-Indigenous teachers to identify the students with hearing loss.

Lowell (1994) described the culturally different classroom attentional behaviours of Indigenous students in remote communities. While not making eye contact, and apparently engaged in other activities, Indigenous students were in fact attending to their teachers. The exceptions were some Indigenous students with consistent hearing loss who engaged in more eye contact, presumably as a visual compensatory strategy that helped them to cope with diminished auditory input. However, non-Indigenous teachers are usually unaware of these cultural differences in attentional style and the use of visual compensation strategies by some students. This makes it difficult for non-Indigenous teachers to identify the students with a current hearing loss on the basis of attentional behaviour.

In this study, two out of three urban Indigenous students with current hearing loss were found to watch the face of their teacher in one-to-one conversation for about 70 per cent of the time, as did the three non-Indigenous students with no hearing loss. However, the three Indigenous students with no hearing loss face watched for about half this amount of time (40 per cent). This means that teachers who use apparent inattention as an indicator of possible hearing loss are, firstly, likely to interpret the evidence before them in the wrong way because Indigenous students without hearing loss pay attention in class in ways that teachers do not expect. Secondly, the visual compensation strategies of some Indigenous children with hearing loss may lead teachers to mistakenly believe that these students have good attention skills and are unlikely, therefore, to have conductive hearing loss. There was supporting evidence for this view in the surprise shown by one teacher of a target student when told that the student had hearing loss. The
student’s compliant classroom behaviour, which included close observation of the teacher, had led the teacher to believe the student did not have hearing problems. Her lack of academic progress, despite her good attention, had led the teacher to conclude that she was not as ‘smart as she appeared’.

These findings may help to explain the apparently inexplicable research results obtained when data had been based on non-Indigenous teachers’ perceptions of Indigenous students’ attention styles. Lewis (1976) found a negative correlation between children’s teacher-identified attentiveness and their reading ability: the students identified by teachers as paying the best ‘attention’ were poorer readers than those who appeared to pay less attention to the teacher. Reinterpreted, taking into account the possibility of a cross-cultural misinterpretation of attentional styles, these results may signify an association between limited reading ability and the visual compensation strategies that can be associated with conductive hearing loss. This may be a more plausible explanation of the results than that children who attend poorly in class are better readers.

As teachers’ perceptions of student inattention in class can be an unreliable guide when they are considering the possibility that a student may be affected by hearing loss, there is a need for other strategies that teachers can use to identify the Indigenous students who have a hearing loss, or a history of hearing loss. The results of this study suggest that the game ‘Blind Man’s Simon Says’ may help to address this need. The evaluation of this game indicated that it had good sensitivity (95 per cent) when used to identify those with current hearing loss, but less satisfactory specificity (75 per cent) when used to exclude those without hearing loss.
In the selection of a screening instrument, specificity is usually the more critical element. Poor specificity would normally mean that a high number of those in need of audiological, medical and educational support would not receive it. Poor sensitivity has less drastic implications for those tested, but has some implications for the resources that need to be expended on screening. The inclusion of a number of children without current hearing loss in the group of children identified for formal audiological or medical assessment may mean that some resources are spent on unnecessary tests. However, this is a lesser evil than missing students who may need the additional professional support. In this respect, the test is accurate, inexpensive and a simple way of identifying children who may have hearing problems.

A further advantage of this particular speech reception test is that it identifies the students with hearing loss in a way that is immediately meaningful. This is important, because even when hearing loss has been identified as a problem, parents and teachers sometimes ignore it. The implications of conductive hearing loss for communication and education are not readily apparent when test results are presented in the form of an audiogram, which does not show people the practical consequences of present hearing loss in a particularly meaningful way. Further, hearing loss is described in terms (slight, mild, moderate) that may tend to minimise concerns about levels of hearing loss that may, in fact, have major communicative, social and educational consequences. The ‘Blind Man’s Simon Says’ speech reception test can be used to demonstrate the effect of hearing loss in a meaningful way to parents.

Another advantage of this test is that is can be used in schools which do not have easy or regular access to audiological services. In the absence of regular
- or any - audiological screening it can help teachers and parents to identify the students who may have a hearing loss. This can encourage them to refer individual students for formal hearing tests, and also prompt the adoption of adaptive communicative strategies by parents and teachers. The use of adaptive communication strategies can help to protect a child from some of the adverse outcomes described in other chapters.

**Discussion**

**Indigenous educational theory**

Indigenous educational theory has mostly focussed on cultural and linguistic factors that contribute to poor educational outcomes (Harris, 1980; Malin, 1990) and socio-political oppression (Nicholls et al., 1996). The suggestion is made in Chapter Three, that conductive hearing loss may be an invisible piece of this cultural and linguistic jigsaw.

At the time Harris (1980) identified specific Aboriginal learning styles, middle ear disease was endemic in the communities he worked in. The Aboriginal learning styles he identified should perhaps more properly be termed ‘Aboriginal learning styles evident in communities where most people experienced conductive hearing loss’. Conductive hearing loss can make people appear more culturally different, or perhaps more accurately, less cross- culturally adept. There is evidence that conductive hearing loss inhibits the successful cross-cultural contact that is needed to develop cross-cultural knowledge and skills (Howard, 2006). This can mean that Indigenous children with hearing loss appear, as one teacher put it, to be ‘more Aboriginal than other students’ (Howard, 1990). It also means that Indigenous children with conductive hearing loss will be advantaged by culturally congruent communication and teaching styles (Lowell, 1994;
Howard, 1994; Partington & Galloway, 2005) and when unfamiliar cultural knowledge is explicitly taught (Howard, 1994; Partington & Galloway, 2005).

Moreover, apparent socio-political oppression (Nicholls et al., 1996) may in part reflect the influence of conductive hearing loss that hitherto has not been identified. In recent work I found that Indigenous adults with listening problems were often reluctant to participate in meetings and often felt intimidated by non-Indigenous staff (Howard, 2006). Widespread conductive hearing loss may undermine the ability of Indigenous people to participate and exert influence in various situations, and especially in cross-cultural contexts. Conductive hearing loss appears to be a factor that contributes to Indigenous disempowerment.

Recent research points to the influence of social and emotional factors on educational outcomes, as well as to the influence of conductive hearing loss on social and emotional outcomes (Zubrick et al., 2006). These findings highlight the importance of Indigenous student wellbeing if the students are to achieve better educational outcomes. This a welcome reorientation of the sort of thinking that has led to the preoccupation in some quarters with improving literacy outcomes, as a single strategy that will lead to improvements in Indigenous educational outcomes. Poor educational outcomes can not be explained or resolved by focusing on a single element of the total equation. While literacy is an important factor, so is absenteeism, and so are listening problems related to middle ear disease. All are interrelated in ways we do not fully understand. However, while most of the critically important factors have been identified and considered as pieces of the jigsaw puzzle of Indigenous educational theory, this is not the case with conductive hearing loss. This piece of the puzzle has been missing for a long time, and its absence has hampered our ability to look at and understand the
whole picture. A multi-dimensional theoretical model of Indigenous education (Partington et al., 1997) needs to include conductive hearing loss, both as a critical factor in its own right and as one that influences other important considerations, such as cross-cultural capacity and disempowerment.

**Indigenous educational psychology**

Educational psychology has had a long tradition of investigating intra-individual factors that contribute to poor educational outcomes. The tools it uses, such as psychoeducational assessments, focus on the skills of students measured in one-to-one communication in ideal listening conditions. However, there are problems in relation to the cultural validity of psychoeducational assessments, and school psychologists often avoid using this type of assessment with Indigenous students. This means that, as the results of this type of testing are used in decisions about the allocation of educational support resources, Indigenous students tend to miss out, because there are no results to show that they should be eligible for this support.

It is also important to consider the ecological validity of these tests, for both Indigenous and non-Indigenous students with conductive hearing loss. The performance of students during multi-speaker conversations in noisy classrooms may be markedly different from their performance in test results. This means that, for children with listening difficulties, psycho-educational assessments, if they are to produce valid results, would need to carefully consider the child’s functional performance in different listening environments as well as their test performance in ideal listening conditions. As has already been noted, psycho-educational assessments are often central in decisions are made about the allocation of scarce educational resources. Children with listening difficulties, whatever their cultural background, may
also receive a lower than desirable level of educational support because the real-life educational obstacles they face are underestimated during testing carried out in ideal listening conditions. Given that middle ear disease is more prevalent among Indigenous and other disadvantaged groups, this process further disadvantages children who are already facing multiple types of disadvantage.

This study avoided using approaches that involved assessments of individual student’s skills or knowledge using psycho-educational tools. The results of the study point to important factors that are not related to any intra-individual traits which may contribute to school behaviour problems. Factors that were important included aspects of the school environment (background noise levels), as well as teacher communication strategies and attitudes toward students’ undesirable classroom behaviour. These, together with physical sensory factors (conductive hearing loss) were important in shaping the children’s behaviour and psychological responses.

An experienced school occupational therapist once said to me that ‘the trouble with school psychologists are that they as so psychological’. She meant that school psychologists often sought explanations in deep-seated family problems or a child’s psychological processes, when there were also important and quite straightforward sensory considerations in play. This research and related literature suggests that with Indigenous children, cultural as well as sensory factors and physical aspects of the school environment should play an important part in Indigenous educational psychology. There is a need for a paradigm of Indigenous school psychology that considers individual psychology within a framework of important sensory, ecological and cultural factors.
Why is conductive hearing loss such an invisible issue?

Conductive hearing loss has been a largely invisible issue in Indigenous education, despite awareness of the high prevalence of this type of hearing loss among Indigenous children. In the thirty years since the high prevalence of conductive hearing loss among Indigenous children was first identified, there has been a considerable amount of research into the bio-medical aspects of this conductive hearing loss. However, there has been little research into the social and educational consequences of hearing loss and there is little focus on the importance of this as an educational issue.

Both the report to the Commonwealth Parliament on Indigenous Education and Training (National Report to Parliament, 2004) and the Northern Territory Education Department Strategic Plan for Indigenous Education 2006-2009 (2006) make only passing reference to conductive hearing loss. There are several layers to the apparent ‘invisibility’ of the problem, and many factors that contribute to each layer.

On an individual level, these include the following:

- Because so many Indigenous children experience conductive hearing loss so much of the time, family and community expectations have become conditioned to perceive communicative difficulties associated with conductive hearing loss as normal for most children.

- Teachers focus on more obvious linguistic and cultural differences, as well as on poverty as sufficient explanation for Indigenous students’ poor school performance.
• Cultural differences in attentiveness operate to confuse teachers so they often do recognise that a child may have hearing loss if the child uses face watching as a compensatory strategy.

• The fluctuating nature of conductive hearing loss means that regular testing is needed to identify the children that have a hearing loss at any point in time.

• The division of responsibility for the problem between health and education authorities, where hearing testing is the responsibility of Commonwealth and State or Territory health authorities while education is the responsibility of State or Territory education authorities.

• The poor and in many areas diminishing access to school hearing screening or testing services.

• The fact that there is little incentive for teachers to identify the children with hearing loss when educational policies mostly do not recognise the educational significance of slight to moderate levels of hearing loss.

On a system level, the factors that contribute to the invisibility of this problem include the following:

• Indigenous educational theory has not given sufficient consideration and credence to the influence of conductive hearing loss.

• Educational policy is based on inconsistent research results from studies involving non-Indigenous students who experience far less
conductive hearing loss and are subject to fewer of the other types of disadvantages which are known to compound the effects of conductive hearing loss for Indigenous children.

- Teacher training does not pay sufficient attention to the educational effects and implications of conductive hearing loss.

- The educational consequences of conductive hearing loss are marginalised when it is treated as a special education issue.

- Within the special education services, the pre-eminence of ‘individual deficit’ explanations for a child’s school difficulties mean that it is difficult for other perspectives to gain attention.

- There are few individuals (in the fields of academia or service provision) who have experience of the multi-disciplinary issues associated with conductive hearing loss among Indigenous children and of programs that can encompass the health and education aspects of the problem, so it is difficult to open the necessary channels of communication between the relatively closed institutional silos of health and education.

- The difficulties associated with post-graduate research in this multi-disciplinary area given the framework of academic conventions which dictate that post graduate research must be undertaken by a sole researcher.

- There are complex methodological issues to resolve when undertaking research of this type.
On a political level, the following situation applies:

- As conductive hearing loss is often an invisible issue for Indigenous people and the affected communities who are therefore not in a position to advocate about it.

- In this time of ‘market driven policy’ (Connell, 1998) issues that are not advocated for by an empowered interest group, often gain little attention.

- The concentration of Indigenous voters in remote electorates may encourage the major parties to view the electoral outcomes in those places as assured, and they may pay little attention to issues that affect the people in those electorates, notwithstanding their significance for the people themselves.

At present the only active advocates of the need for a greater general awareness of the problems and issues associated with conductive hearing loss are the professionals and organisations that have investigated the problem or provide services that are affected by it. The problem must be better and more widely understood if the issues that arise because of its persistent invisibility are to be overcome.

**Relevance in other settings**

Since this research examined basic elements of social dynamics (verbal communication, background noise) they are relevant in other settings. The processes described in this study can be evident in any situation where
individuals or groups of people with hearing loss are found; for example, in the criminal justice system, in employment, and in childcare.

There is a known high prevalence of hearing loss among Indigenous prison inmates (Murray et al., 2004). Howard, Quinn, Blokland and Flynn (1993) describe strong anecdotal evidence that hearing loss may contribute to behaviours that lead to involvement in the criminal justice system. As is the case with schools, the criminal justice institutions are crowded and noisy, and the mostly non-Indigenous staff exercise even tighter control of the opportunities that Indigenous inmates have for social interaction. During training sessions with staff working in correctional service settings, staff told of experiences that confirm the importance of background noise as a key factor in disruptive behaviour. The staff reported that fights and arguments most often occurred during times, and in places of high background noise, such as the muster areas. In one setting the number of fights about the use of a telephone diminished when it was replaced with a phone that was enclosed, in that way reducing the level of intrusive background noise for those using it. In another instance, disputes in a residential setting increased after Indigenous inmates were moved into a new residential setting with many hard reverberant surfaces. They reduced when the inmates were moved back to a residential setting with soft furnishings that reduced reverberation.

For Indigenous people in employment, the level of background noise has been found to be affect performance and present social difficulties for trainees with listening problems (Howard, 2005). In childcare centres, Kelly and Weeks (1991) reported on the high prevalence of conductive hearing loss amongst non-Indigenous children in two Perth childcare centres. Twenty eight per cent of the children in care had a current hearing loss, and 64 per
cent of the children under three had an identified conductive hearing loss. Although the behaviour of the affected children was known to be difficult, carers had seldom correctly identified the cause of their problems as a hearing loss; the children were thought to be ‘disobedient, naughty, lazy or ignorant’ (Kelly & Weeks, 1991, p. 345). These results appear to have relevance in understanding and addressing Indigenous disadvantage in many areas.

**Significance of this research**

Research in this area with Indigenous children is essential for the development of relevant and appropriate Indigenous educational policy and practice. This is one of the few studies to be carried out this area with Indigenous students. It is also important that this research has been carried out with urban Indigenous students. This is the educational context where most Indigenous students attend school, but it is the area that least research in this area has been carried. An analysis of educational research on Indigenous hearing loss suggests there are quite different outcomes associated with conductive hearing loss in different school contexts (Howard, 2004). The more cross-cultural the educational context, the more likely it seems that adverse communication and educational outcomes will occur. This means that it is important to investigate the effects of conductive hearing loss in each major school context.

This study involving a few students with conductive hearing loss, using a mixed research embedded case study design, has resulted in a better understanding of the nature of the associations between conductive hearing loss and the poor social and emotional outcomes and school behaviour problems that are evident in larger quantitative studies (Howard, 2004; Zubrick et al., 2006). This understanding makes it possible to design
appropriate interventions, such as teacher training programs and a simple way of identifying students with conductive hearing loss, to minimise the adverse effects of conductive hearing loss for affected individuals. As teachers now have limited and diminishing access to whole class audiological data, the results of this research are more important now than they were when the data were collected. When teachers have limited access to information on a student’s hearing status, this inevitably contributes to the ‘invisibility’ of the problem. This, in turn, contributes to the neglect of conductive hearing loss as an educational policy issue. The easy-to-use classroom identification tool evaluated in this research may help to address these problems. A recent review of services for Indigenous children in South Australia point to the critical issues in service provision in this area are the absence of school based hearing screening strategies and classroom strategies for teachers (Snodgrass, 2006).

The results of this study also appear to be relevant for Indigenous people in other settings, and for non-Indigenous children in schools. Conductive hearing loss may be involved in the disadvantage Indigenous people experience in a variety of different settings. Understanding the processes whereby conductive hearing loss can lead to disadvantage that are described in this study may serve as a guide; to help people deal with negative consequences of conductive hearing loss in other sectors.

It is important to keep in mind what was pointed out in the first chapter. That the term conductive hearing loss or listening problems has been used for the sake of simplicity of expression. However, the functional listening difficulties that contributed to the responses observed in this study should not be assumed to derive only from current hearing loss. Rather a history of middle ear disease is likely to have contributed to auditory processing problems, including speech discrimination in noise and auditory memory
difficulties. These factors together with current hearing loss are likely to have created difficulties with speech perception in noisy environments. Simply resolving the current hearing loss is unlikely to resolve all the difficulties experienced.

**Directions**

**Implications for educators**
It is important that educational policy and practice in relation to conductive hearing loss is guided by research with Indigenous children. If it is not, both the policies and practices will be based on research from population groups that experience a far lower incidence of conductive hearing loss and share few of the other disadvantages that compound the effects of conductive hearing loss for Indigenous children. The following suggested courses of action are based on the findings from this and other studies. They are designed to address the problems that Indigenous students with hearing loss encounter in schools.

**Pre-service and in-service teacher training on the relationship between hearing loss, background noise and behaviour problems**
When teachers understand the relationships between these issues it can change their ‘meaning-perspectives’ about the behaviour of students with conductive hearing loss. This may help to minimise the risk of teacher disengagement when teachers are confronted with ‘difficult students’ whose behaviour problems are related to their hearing loss. Training should also cover other points made in this section.

**Amplification**
Sound field amplification, where amplified speakers in the classroom make the voice of the person talking easier for everyone to hear, is desirable in
classrooms, and especially those with a number of Indigenous students.

Another form of amplification is rarely used in classrooms, but is also a useful tool. This is a small individual amplifier (one brand is known as a ‘pocket talker’) which uses a microphone attached to clothing to pick up the voice of the speaker and amplify this through a set of headphones used by a single listener. The rationale for the use of this form of amplification is that it is often mostly the students with conductive hearing loss who need one-to-one support, and a device of this sort facilitates the delivery of this type of support.

**Development of appropriate and effective behaviour management strategies**

The use of behaviour management strategies that exacerbate children’s social exclusion is likely to be both damaging and ineffective when the behaviour problems are associated with hearing loss. There is a need for alternative strategies that address the children’s need to be able to understand instructions and/or for social inclusion, notwithstanding the combined effects of hearing loss and background noise in schools.

**Managing social organisation in classrooms to minimise background noise**

The social organisation of the classroom should be managed in ways that control noise and create social opportunities. Strategies for this include teacher imposed silences when teachers are giving instruction and, during group work, rotating the students through alternating ‘silent’ and ‘talking’ activities.
Managing school design and classroom acoustics to minimise background noise

The existing literature on this subject is not currently in a form that is readily accessible to teachers, and it does not address the implications of noise in the playground, an important social arena in schools. Training programs and written material are needed to help teachers and school managers plan school activities in ways that minimise background noise levels in both classrooms and the playground.

Managing social organisation to foster positive social interaction in the classroom

If the social problems related to hearing loss and background noise are to be solved, students must be supported in ways that will help them to achieve successful outcomes from their social involvement. Support for peer-oriented learning strategies and overt teaching of pro-social behaviours will help them to do so.

Improving teacher:student ratios

A lower teacher:student ratio not only reduces background noise levels, but also gives teachers more opportunity to develop better relationships with their individual students.

Using or supporting classroom strategies that allow visual coping strategies to be used during verbal instruction

Students use visual coping strategies to help them in class. Their use of these strategies is influenced by classroom layout and the approach of their teacher. For example, a horseshoe-shaped seating arrangement makes it easy for a student with hearing loss to see what others are doing. One appropriate teaching strategy is the use of repetitive modelling; the teacher presents a lesson then asks some students to model it, which gives other students an
opportunity to observe it for a second time before attempting a task themselves.

**Involvement of students in social skills programs**

A key finding of this study was that some children with conductive hearing loss show evidence of dysfunctional social skills at school. This suggests a need for social skills training so teachers can identify the social skill needs of particular children and also be aware that some students may have developed ‘alternative’ social competencies that may functional in some social situations, although dysfunctional in others. Social skill programs will need to take into account the influence of background noise as an obstacle to social interaction. Finally, social skills training should involve not only the target students themselves, but also those with whom they may interact. For example, peers and family members should understand that they need to speak clearly, face the person and avoid noisy environments when speaking to them. However, there is also much to be learnt about successful individual communication styles from those who know a child well.

**Schools with high numbers of Indigenous students should consider establishing small multi-age class groups made up predominately of Indigenous children who can remain together as a class group over a number of years**

This type of class grouping can foster deep relationships that can be protective against social problems of the kind observed in this study. Small class size minimises background noise and maximises opportunity for teacher support. Multi-age, same- culture class groupings also foster peer support.
Teachers of multi-age class groups should be Indigenous or selected because of their interest and experience in working with Indigenous children

Same-culture teachers who are familiar with the students are the most successful in communication with Indigenous students with hearing loss (Lowell, 1994; Massie, 1999). If Indigenous teachers are not available, then the non-Indigenous teachers who are selected for positions where they will be working with Indigenous children should have an interest in, and experience of working with Indigenous students (Malin, 1989; Hudspith, 1997). Schools should be organised to facilitate the development of long term teacher-student relationships. Indigenous education workers should be available to provide the additional one-to-one assistance that may be needed to support Indigenous students with hearing loss (Howard, 1992, 1994), and to act as communication and cultural brokers in classrooms with a high proportion of Indigenous students with hearing loss.

Training of other school staff, especially senior staff, to understand the educational needs of Indigenous children affected by hearing loss

The work that individual teachers do to support Indigenous students can be undermined by a lack of support from other school staff, and especially senior staff (Partington et al., 1999). There must be school-wide understanding of and support for programs to address the educational needs of Indigenous students with a history of hearing loss, if the programs are to succeed.

Training teachers to understand cultural differences in attentional style and simple tools to test for hearing loss in the classroom

The minor component of this study has highlighted the need for training of non-Indigenous teachers so they are aware of cultural differences in
attentional style, and for teachers who are trained to use the classroom tools that can be used to identify students with conductive hearing loss.

**The ideal classroom**

It is worthwhile to consider what an ideal classroom for Indigenous students with conductive hearing loss would look like. The ideal classroom for urban indigenous students with hearing loss would have the following features.

- The classroom is designed and fitted out to minimise intrusion from noise outside and reverberation from noise within.

- The class size would be no more than 10-15 students in a multi-age group. This would serve to minimise noise levels and encourage peer tutoring.

- There would be a teacher and a tutor available to work with the students who are trained in issues around conductive hearing loss and culturally responsive schooling. These staff would have elected to be involved in this program and the local Indigenous community would be comfortable with their involvement.

- There would be support available to help deal with social and emotional issues that may arise at school or outside school.

- The classroom would be fitted with a sound field amplification system and the teacher and tutor would have a form of ‘pocket talker’ to use when working with individual students in need of this type of support.
• The teacher and tutor would have access to highly visual resource materials to use during group and individual instruction.

• The timetable would include listening breaks to reduce the risk of listening overload.

• The program would include phonological awareness training and explicit teaching to establish a framework of understanding of any unfamiliar Western curriculum content.

**Future research**

This section outlines the principles that can be used to guide future research, and some important areas for future research based on the results of this study.

**Holistic and integrative**

Increasingly, the fragmented and disjointed approach to research and service provision in this field is failing Indigenous people. Health researchers have led the way in attempting to address this problem by seeking to avoid a ‘body parts’ approach to Indigenous health. Holistic and integrated approaches are essential when dealing with Indigenous conductive hearing loss. It is a challenge for mainstream research institutions (including universities) to conduct research that is multi-sectorial, multi-disciplinary and cross-cultural. It is particularly difficult for individual student researchers working alone to do so. Universities need to become more accepting and supportive of group research programs.
Educational answers
Educational research into conductive hearing loss has often been designed to answer medical questions; for example, examining the long-term educational consequences of early hearing loss to justify more aggressive medical treatment of early otitis media. There is a need to ensure that educational research is focused on educational questions and issues.

Social interaction, not just language competence
The results of this study show quite clearly that for Indigenous children with conductive hearing loss, language is only one component of their social interaction. The attempts of students to compensate for linguistic disadvantage can result in the adoption of distinctive patterns of non-verbal behaviour. An understanding of the things children do socially when they cannot easily communicate verbally is essential to any understanding of the outcomes of conductive hearing loss.

Children may respond dynamically to communicative disadvantage
The preoccupation of many researchers with linguistic and academic ‘delay’ carries with it an implicit assumption that children will respond passively to the communicative difficulties associated with hearing loss. However, this research shows that children’s responses to communicative disadvantage can be dynamic as they seek alternative ways to communicate with others and remain socially involved. Future research could usefully investigate the nature of children’s dynamic responses to the disadvantages associated with conductive hearing loss.

The responses of other people to the children
This research also shows that children’s dynamic compensatory responses may often be dysfunctional. The response of those interacting with the child
is as important as the child’s response in determining the functional success or failure of a child’s compensatory strategies. There is a need to consider the ways in which other people respond to the children, not just children’s responses.

**Communication with peers not just teachers**

Past research has assumed that the critical issue in relation to hearing loss is the nature of a child’s access to the teachers’ verbal communication. However, this study suggests it is important to consider students’ social interaction with their peers, as well as with their teachers. From a child’s perspective, the impact of hearing loss on their interaction with their peers, especially when socialising and playing sport, is often of greater immediate importance to them than its impact on their interaction with teachers.

**Professional and institutional responses**

An important question, for anyone seeking better educational outcomes for Indigenous children with hearing loss, is the ways in which professionals and institutions may in fact contribute to their problems. For example, deficit thinking about Indigenous children has often been used as an excuse for the perpetuation of existing services that do not meet the needs of the Indigenous client group. Professional and institutional attitudes and responses to the situation are an important focus for future research.

**Interaction of hearing loss with multiple variables**

This study has considered the interaction of conductive hearing loss with a number of other variables, in particular, background noise, receptive language deficits and teacher-controlled social interaction structures. The results suggest that there is a need to look at the relationships between these
variables, and to focus less on the role that individual factors, such as the hearing loss, may play, in isolation.

**Interaction between hearing loss and cross-cultural communication**
The cross-cultural contexts of different schools appear to result in quite different outcomes for Indigenous children with hearing loss. This is an important consideration for future research. The results of this study also suggest that culturally based misperceptions can complicate the identification of children with hearing loss.

**Other research topics**
A key focus for future research is the need to examine the extent to which the findings from this study are applicable in different contexts, such as:

- different school settings;
- noisy home environments;
- work environments;
- child care settings;
- sporting venues; and

More generally, it would be helpful to know the extent to which the social difficulties created by hearing loss act as a mediating agent with reference to the known areas of disadvantage experienced by Indigenous people. How do they affect employment, family functioning, and the over-representation of Indigenous people in the criminal justice system?

**Auditory processing problems**
Last, but certainly not least, a potentially critical area for future research is the way in which auditory processing problems, as well as conductive hearing loss, influence Indigenous educational, as well as social and
emotional well being. Indigenous people experience a high prevalence of auditory processing problems, as a consequence of endemic conductive hearing loss. Yonovitz and Yonovitz (2000) found that 40 per cent of Indigenous children had signs of auditory processing problems. This compares with ten per cent of children in the non-Indigenous population. An investigation of the influence of the combined effects of conductive hearing loss and auditory processing problems on styles of communication, social styles and self-perception might generate results that would lead on to the development of new intervention strategies that can better address the multi-faceted nature of Indigenous disadvantage.

Closing Comments

The endemic conductive hearing loss experienced by Indigenous children is one of the factors that contribute to social disadvantage and whose influence is poorly understood. This study is among the first to explore the processes through which hearing loss can contribute to Indigenous disadvantage. The findings demonstrate the complexity of a number of interacting factors. Hearing loss interacts with the physical and cultural environment of schools to shape social outcomes for students. These social outcomes interact in turn with a range of other factors that may prove to be the building blocks of disadvantage in education, employment and within the criminal justice system.

These findings are cause for concern, for hope and for action. They are a concern, because they point to Indigenous hearing loss contributing to Indigenous students’ social and emotional disadvantage. They give rise to hope, that a better understanding of how hearing loss contributes to social and educational problems at school can result in better management of these
problems and better educational outcomes for the affected students. Finally, and urgently, they give impetus for action to translate this hope into reality.
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Appendix One

How to play 'Blind Man's Simon Says'

Select four or five students at a time for this activity. Be sure to select a mix of students in each group, including some who you believe have good hearing. Firstly, explain the rules - these are that you will ask them to shut their eyes and then ask them to do some things, often in a very quiet voice. The students participating stand at the front of the classroom, while you stand at the back. Try to minimize the background noise in the room during the game; turn off air conditioners, heaters and fans. Play the game somewhere away from where other children can observe. It is easiest to do with two adults participating.

Step One

Start the game by saying one at a time all the instructions you are going to use in a loud, clear voice to ensure all the students can perform the directions when they are given in a loud voice.

Below is a list of instructions you can use.

- Put your hand on your nose.
- Put your hand on your hair.
- Put your hand on your cheek.
- Put your hand in the air.
- Put your hand on your ears.
- Put your hand on your chin.
- Put your hand on your knee.
Be sure to vary the order that these directions are given when playing this game regularly, so students can not predict what they are going to be asked to do next.

**Step Two**

After all the students have demonstrated that they can follow these instructions when they are given in a loud voice, tell the students that you are now going to say them quietly.

Dropping your voice, but not whispering, give a direction. If you have another adult whose hearing is known to be OK, then they can help you get the right sound level by standing beside the students, watching the students, and letting you know by nodding, that your voice level is loud enough to be just heard. When you first start try saying the words very quietly, so quietly that no one hears them. Then say them a little louder till some hear. This will help you get the ‘baseline’ of what is too quiet. If all the children have difficulty hearing you then you know you need to raise your voice level.

Often when people are first starting they speak too loudly so even children with a hearing loss can still hear. It is important to use the students participating to check your level, lowering your level till some students can follow the instructions but others have difficulty. The children in the group with normal hearing allow you to know that you can be heard. This is why it is crucial that the groups are not made up only of students whose hearing is suspect. If you find everyone in a group appear to be having some difficulties, stop the game and change the composition of the group to include some children who are likely to have good hearing- children who are
rarely behaviour problems and who often respond verbally in an appropriate way even when it is noisy in class.

Step Three

When you have said the instruction twice quietly, repeat it in a loud voice again. Those requiring a louder level of voice to ‘hear’ are then obvious. Keep to this pattern of ‘quiet, quiet, loud” for each instruction. This also ensures that even those with who have difficulties hearing can still experience success during the game. This is important because if children with hearing loss only experience failure playing this game they will be reluctant to participate again.

Step Four

Continue to go through the different instructions until you can discern which students are having consistent difficulties. Some words, through sounding similar, are harder to distinguish between - for example air, ear and hair; cheek and chin; knee and nose. Use these more frequently to help confirm which children are having difficulties.

What to watch for

As well as watching for students (a) who have consistent difficulties following the directions you give in a quiet voice and (b) who make sudden corrections when you say the direction, finally, in a loud voice, also watch for students who:

(c) follow the instructions after a short delay,
(d) turn to peek at what others are doing,
(e) consistently turn their head around to favour one ear,
(f) make ambiguous movements - for example having their hands
‘hover’ around the sides of their head - or,

(g) are reluctant to participate or are disruptive during the game.

Take note of students who you consistently observe responding in these ways. These are students whose hearing is suspect and it would be worthwhile to refer for hearing testing. These are students who you need to take care in communicating with and to use the teaching strategies outlined in the ‘ear troubles’ program.

Parents and teachers can also use this activity to check the hearing of individual children. With individual children another person sits or stands next to the child and follows the same directions- this is important to check you are speaking loud enough to be able to be heard. First go so quiet that neither the checker nor the child can hear and then go louder till the checker can hear the quiet instruction. You play the game the same way giving instructions in the ‘quiet, quiet, loud’ pattern and noting if the child has difficulties of the type outlined above.

Students with a current hearing loss in both ears and even some students with a loss in one ear display obvious difficulties during this activity. Further, some other students, without a current hearing loss but whom may have had past hearing loss which has left them with some language or auditory processing problems may also demonstrate problems.

This simple activity is usually popular and can be used regularly with the whole class. Remember conductive hearing loss fluctuates so it is important to check hearing by using the game every month or so. It is an activity that can be useful to suggest students to refer for hearing tests as well as, importantly, to assist teachers to be aware of which students in their class are
having difficulties with verbal directions of the kind that so much classroom instruction is based around.