LOCUS OF CONTROL AND NATIVE INDIAN CHILDREN WITH HISTORIES OF A HEARING LOSS

by

DOUGLAS M. MACLEOD

B.Ed., University of British Columbia, 1974
Diploma in Education of the Hearing Impaired, University of British Columbia, 1988

A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF ARTS in
THE FACULTY OF GRADUATE STUDIES

(Deptartment of Educational Psychology and Special Education)

We accept this thesis as conforming to the required standard

The University of British Columbia

September 1993

© Douglas M. MacLeod, 1993
In presenting this thesis in partial fulfilment of the requirements for an advanced degree at the University of British Columbia, I agree that the Library shall make it freely available for reference and study. I further agree that permission for extensive copying of this thesis for scholarly purposes may be granted by the head of my department or by his or her representatives. It is understood that copying or publication of this thesis for financial gain shall not be allowed without my written permission.

(Signature)

Department of Educational Psychology and Special Education

The University of British Columbia
Vancouver, Canada

Date September 29, 1993
ABSTRACT

Very little is known about the relationship between locus of control (LOC) orientation and mild or temporary hearing losses associated with chronic otitis media. Furthermore, it seems this relationship may never have been studied in the unique cultural context of Northern Canadian Native Indian societies.

The present study investigated the relationship between LOC orientation and hearing status category among Carrier-Sekani children from Northern British Columbia. The relationship between LOC orientation, chronologic age, and academic achievement was also explored. Demographic data collected for a larger study, provided an opportunity to conduct some post hoc analyses on LOC orientation, place in the family, number of parents in the home and family income.

Ninety Carrier-Sekani students from grades four to twelve, received a modified Nowicki-Strickland Locus of Control Scale for Children. Students were divided into two broad categories, normally hearing and those having a history of a hearing loss. The latter category was further divided into students with a pure tone loss, students with a history of chronic otitis media and those with observed otitis media at the time of testing. Students could be members of more than one sub-group.

Correlation coefficients and Analyses of Variance were computed to explore the relationship between LOC orientation and the independent variables.

No significant relationship was discovered between LOC orientation and category of hearing loss. An internal LOC orientation was positively associated with chronologic age, medium family income, two parents in the home and partially associated with academic achievement.
This study indicates that for Carrier-Sekani students, a mild or temporary hearing loss is not significantly associated with an external LOC orientation. It seems that school related variables and demographic variables commonly associated with LOC orientation in the samples described in the literature are also present in the sample studied in this project.
TABLE OF CONTENTS

Abstract ............................................................................................................................... ii

Table of Contents ............................................................................................................... iv

List of Tables ....................................................................................................................... vi

Acknowledgements .............................................................................................................. vii

Chapter I - Introduction ..................................................................................................... 1
  Native Indian Children With Histories of a Hearing Loss and School Performance .......... 2
  Locus of Control and Native Indian Children With Histories of a Hearing Loss ............... 5
  Definition of Terms ........................................................................................................... 6
  Statement of the Problem .................................................................................................. 8
  Hypotheses ....................................................................................................................... 8

Chapter II - Review of the Literature .................................................................................. 10
  Introduction ...................................................................................................................... 10
  Antecedents of Locus of Control ..................................................................................... 11
  Locus of Control and The Deaf ....................................................................................... 13
  The Measurement of Locus of Control Orientation in Deaf Populations ......................... 16
  Locus of Control and Hard of Hearing Populations ......................................................... 17
  Summary of the Research on the Deaf and Hard of Hearing and Locus of Control .......... 18
  Locus of Control and Native Indian Students ................................................................. 19
  Summary of the Research on Native Indian Students and Locus of Control ................. 22
  Hearing Loss and Native Indian Children ....................................................................... 23
  Otitis Media and Child Development ............................................................................. 24
  Otitis Media and Behavior .............................................................................................. 28
  Summary of the Research on Otitis Media .................................................................... 29
  Summary .......................................................................................................................... 30

Chapter III - Method ......................................................................................................... 31
  Design ............................................................................................................................... 31
  Hypotheses: ...................................................................................................................... 31
  Subjects ............................................................................................................................. 32
LIST OF TABLES

Table 1. Descriptive statistics for LOC orientation and achievement ...............................................38

Table 2. Pearson Correlation Coefficients for LOC orientation and academic achievement ..........................................................38

Table 3. Mean LOC scores by hearing status category and sub-category .................................................41

Table 4. Analysis of Variance of LOC scores by hearing status category and sub-category ..........................42

Table 5. Mean LOC scores by parents in the home ..............................................................................44

Table 6. Analysis of variance of LOC scores by parents in the home .......................................................44

Table 7. Mean LOC scores by family income ....................................................................................45

Table 8. Analysis of variance of LOC scores by family income ..............................................................45

Table 9. Mean LOC scores by place in the family ..............................................................................46

Table 10. Analysis of variance of LOC scores by place in the family .....................................................46
I would like to thank the members of the thesis committee for their assistance, Dr. Nand Kishor, Dr. Perry Leslie, and Dr. Arthur More. Dr. Leslie is owed a special acknowledgement for all his much needed support and advice. I would also like to bestow my deepest gratitude to my wife, Mariette, and my two sons Kyle and Ewan. Their sacrifices have been sincerely appreciated.
EDUCATORS are constantly reminded of the importance of understanding and attending to the affective development of students. This necessity has taken on new meaning in British Columbia with the publishing of Year 2000: A Framework For Learning (1990). The document emphasizes the need to foster in students such things as: critical thinking skills, self-motivation, a positive self-image and independent decision making. An assessment framework is described that focuses on individual learner progress and de-emphasizes reference to external norms such as class or grade. This initiative presents some challenges to educators of special needs students. Interventions and special placements must encourage students to approach tasks with a sense of responsibility and control of their own education. An understanding of the locus of control (LOC) construct can assist teachers in meeting this challenge.

The LOC construct describes the degree to which individuals see events in life to be under their control or the result of outside forces. How students view their ability to influence events in life has a significant impact on their ability to set and be motivated to achieve goals. An internal perception of control is frequently associated with academic and social success (Gilmor, 1978; Lefcourt, 1976). While minority groups often score externally on LOC measures the patterns of association within a minority group may be similar to the larger population (Lefcourt, 1976; Guagnano, Arcredolo, Hawkes, Ellyson & White, 1986; Shorr & Young, 1984).

The students in this study have two unique sets of experiences that distinguish them from the majority population and likely influence the formation of their LOC orientation. They have both Indian status and a history of a hearing loss. The population contains within it those who display evidence of having had a temporary loss due to otitis
media to those who have a permanent mild pure tone loss. This level of loss has received very little attention in the literature as most research on what students with a hearing loss has, in fact, concentrated on the Deaf.

**Native Indian Children With Histories of a Hearing Loss and School Performance**

A Northern Canadian native population with a history of a hearing loss is worthy of attention by the academic community for two reasons. First, there is a dearth of research on LOC orientation and both of these sub-groups. A review of the literature must focus on similar populations because research on LOC and children with histories of hearing loss or research on LOC and Native Indian children from Northern British Columbia is completely lacking. Second, both groups present challenges for the school system. Generally these populations are experiencing less academic and social success than their normally hearing, majority culture peers (Armstrong, Kennedy & Oberle, 1990; Jones & Antoine, 1990; Moores, 1987). These two statements bear closer examination.

Most research on the effects of hearing loss has concentrated on the Deaf. Certainly, a population defined specifically as Deaf and a population defined more generally as having a history of a hearing loss share some experiences in common and research on the Deaf can provide insights into the education of children with a history of a hearing loss, but they are separate populations. A review of LOC and deafness must be viewed strictly as a starting point.

The school system continues to struggle to come to terms with deafness. Deaf children evolve their personalities in a reality that is altered by problems in communication. Their experiences are qualitatively different than their hearing peers and their interpretations of those experiences are different as well (Meadow, 1980). While there has been a great deal
of progress in the education of the Deaf, several problems remain perplexing. First of all, there is nothing inherent in a hearing loss that should produce social/emotional problems yet deaf school children have five times as many emotional disorders as their hearing peers (Schlesinger, 1985). Furthermore, there is nothing inherent in deafness that limits cognitive potential but many deaf students have limited academic success. For example, the development of reading skills for Deaf students continue to lag far behind hearing students (Moores, 1987; Quigley & Paul, 1984). Finally, while in many vocations a hearing loss presents no obstacle, Deaf people remain, for the most part an economically depressed group (Moores, 1987). These difficulties are generally attributed to language and communication problems, but attitudes may be a factor and a study of LOC may contribute some useful information.

Native Indian school children are another population with whom the school system has had limited success. The Native Indian child's experience may also be significantly different than that of a child from the majority culture and the evolution of LOC may be different as well. In the past, a school system designed for and by a non-Indian, middle-class put special stresses on Native Indian children. Although it appears that in some areas progressive change is occurring there are several factors indicating that serious problems still exist. As with the Deaf, many Native Indian students are not reaching academic potential. For example, only one-quarter of the Native Indian people in Canada complete high school, compared to one-half of non-Indian people (Armstrong, Kennedy & Oberle, 1990). Forty-one percent of the Native Indian population in British Columbia have less than a grade nine education (Jones & Antoine, 1990). Non-Indians are three times more likely than Native Indians to attend university and seven times more likely to earn a degree (Armstrong, Kennedy & Oberle, 1990). This relative lack of success in the school system is reflected in the economic system as well. In spite of the fact that Native Indian people often live in resource rich regions, as a group, they are underemployed and economically depressed. In
British Columbia, 30.8% of Native Indian people of working age are employed compared to 57.5% of the general population. The income of the average Native Indian person in 1985 was $10,200, compared to $18,700 for non-Indian people (Jones & Antoine, 1990).

For both children with a history of a hearing loss and Native Indian children, a study of LOC may provide teachers with insights that help in understanding the perceptions and motivation of these students, resulting in greater success at school. There are a number of reasons to support this contention. A student possessing a sense of internal control can set academic, vocational or social goals and have faith that plans will be realized (Gilmor, 1978; Lefcourt 1976). Also, an understanding of LOC orientation offers educators a tool to help contribute to the successful placement of Native Indian students with histories of a hearing loss. Educators should examine personality styles of these students, both individually and as a group, and ensure that they are appropriately matched to the educational placement. A study of LOC orientation in this population can contribute to this process. Also, the recent emphasis on active and independent learning, as illustrated by such things as the Year 2000 process in British Columbia, assumes students have the ability to formulate long range plans and put them into place. A sense of internal control is strongly associated with motivation and task persistence (Gilmor, 1978; Lefcourt, 1976). Furthermore, the measurement of LOC may be a useful means of probing the perceptions of students and ensuring that those perceptions adequately match assumptions on which educators are basing their strategies and programs. Finally, in some cases it may be valuable to create conditions that foster an internal orientation of control in order to create situations in which students could be successful. It should be noted that creating programs that foster an internal orientation of control should be carried out considering ethnic and cultural values. In short, the LOC construct may provide educators with some insights and means of addressing the outstanding educational problems associated with Native Indian children with histories of a hearing loss.
Locus of Control and Native Indian Children With Histories of a Hearing Loss

There is very little research in LOC that can be related to the unique population examined in this study. A limited body of research is being built on LOC and Deaf students. On the whole, this population is more externally oriented than their hearing counterparts (Bodner & Johns, 1977; Koelle & Convey, 1981). There are some additional studies providing a scattered and incomplete understanding of the quality and development of LOC orientation in Deaf students. Some general research does exist describing the child rearing style most frequently employed by hearing parents of Deaf children and the psychology of Deaf children. While it does not deal directly with LOC, we can use this research to make some predictions of what we are likely to find by closer study. As mentioned previously, most of the research has been carried out with Deaf children. While this provides some important information, application to a population with a history of a hearing loss must be done with caution.

The research on LOC and Native Indian children is also sparse and incomplete. In general, minority groups are more externally oriented than the majority (Lefcourt, 1976). It appears that Native Indian people follow this pattern and are more externally oriented but it is unclear whether this is due to ethnicity or socio-economic status (Guagnano, G. et al, 1986; Shorr & Young, 1984). A number of factors may combine to influence the development of LOC orientation especially as Native Indian children enter the school system: the language of the home, socio-economic status, general trauma of a society in transition, minority or majority status in school, and a cultural background that may not be reflected in the structure and curriculum of the school. It is interesting to note that many of the issues arising in the political arena of Native Indian life are issues of control, such as Landclaims and Self-government.

The research on LOC and Native Indians has been almost entirely centred in
the United States. While this research provides a starting point, the experiences of Canadian Native Indian people, especially those from remote communities, may well be different and the development of a LOC orientation may be different as well.

When one overlaps these two populations and focuses on children with a history of a hearing loss and Native Indian children, it becomes apparent that very little research has been undertaken. It is known that cases of otitis media are dramatically high in Native Indian children (Scaldwell & Fraume, 1985). Chronic otitis media can result in mild to moderate conductive hearing losses. It seems logical that there is a disproportionate percentage of Native Indian students with a history of chronic otitis media or a mild pure tone loss compared to the non-Indian population but documentation describing the hearing losses of Native Indian children and the effect on learning is lacking. There appears to be no published research on LOC and Native Indian children with histories of a hearing loss 1. It is this gap that the present study seeks to begin addressing.

Definition of Terms

**Locus of Control** – The Locus of Control (LOC) construct describes the degree to which an individual sees events in life to be under his/her control or the result of outside forces.

**Carrier-Sekani Student** – A student who is attending school (K to 12) and is a nominal member of a Carrier-Sekani band. Both status and non-status Indian students have been included.

**Deaf Student** – A Deaf person cannot understand speech through audition alone with or without a hearing aid (Moores, 1987). In addition to this audiological definition, a cultural perspective ought to be added. A Deaf adult sees himself or herself as being part of a unique

---

1 The data bank used in the literature search was E.R.I.C.
group within society. This cultural identity tends to emerge in Deaf students as they progress through school.

**Hard of Hearing Student** – Moores provided this definition of a hard of hearing person, "A hard-of-hearing person is one whose hearing is disabled to an extent (usually 35 - 69 dB, better ear average) that makes difficult, but does not preclude, the understanding of speech through the ear alone, without or with a hearing aid." (Moores, 1987, p. 9).

**Otitis Media** – An inflammation of the middle ear (Katz, 1985).

**Student with a history of a hearing loss** – For the purposes of this study students who fit into two or more of the following categories were defined as having a history of a hearing loss:

1. those who displayed a measurable pure tone loss of 20 dB or greater, in either ear (The students in this category had a mild loss, only a few had a moderate loss. No Deaf students took part in the study.)
2. those who had a medical history of recurrent otitis media.
3. those who displayed scarring or inflammation of the tympanic membrane.
4. those who displayed negative middle ear pressure at the time of tympanometric testing.

**Otitis Prone Student** – a student having a recurrent history of otitis media as indicated by medical records or scarring of the tympanic membrane or a student displaying negative middle ear pressure at the time of tympanometric testing.
Statement of the Problem

Generally, very little is known about the quality and the formation of LOC in Native Indian children with histories of a hearing loss. Specifically, it is not known if Native Indian children with mild or temporary hearing losses differ significantly from normally hearing Native Indian children on LOC orientation.

Hypotheses

1. An internal orientation of LOC correlates positively with academic achievement for both normally hearing students and students with histories of a hearing loss.

2. As a group, students with histories of a hearing loss are more externally oriented than normally hearing students.

3. As a group, students with a mild or greater pure tone loss are more externally oriented than other students participating in the study, including those with recurrent histories of otitis media, those displaying negative pressure and normally hearing students.

4. As a group, otitis prone students are more externally oriented than normally hearing students.

5. An internal LOC orientation correlates positively with age for both normally hearing students and students with histories of a hearing loss.
In addition to specific hypotheses, the study had an opportunity to explore the relationship between LOC orientation and a variety of additional demographic variables. A quick examination of this information served as a means of checking and comparing to see if the demographic conditions associated with LOC orientation in majority populations were also present in this population. No specific hypotheses were formulated for demographic variables before the study began.
CHAPTER II – REVIEW OF THE LITERATURE

Introduction

A unique feature of this study is that it addresses a student population that has membership in two sub-groups, students with a history of a hearing loss and Native Indian students. This review will consider the literature in two separate sections as it pertains to these two sub-groups. There appears to be no published research available on LOC orientation and the broadly defined group in this study termed children with histories of a hearing loss. A review of LOC and Deaf and hard of hearing children provides the only baseline from which to begin research. Most of the students with histories of a hearing loss have had chronic otitis media that has left them with a pure tone loss. A brief review of pertinent research on otitis media has been included at the end of the chapter.

Deaf and hard of hearing children are exposed to experiences that differ qualitatively from hearing children. Interpretation of these experiences differ also (Meadow, 1980; Schlesinger, 1985). For Deaf and Hard of hearing children, exposure to auditory signals in the hearing world is through a variable communication filter. It seems likely that this condition is associated with unique characteristics in the formation of LOC orientation among Deaf and hard of hearing children.

Unfortunately studies in this area are woefully lacking. The research that does exist, provides a spotty and incomplete description. There have been no studies that attempt to explore a broad range of possible variables associated with LOC in Deaf and hard of hearing children to see if patterns are similar to, or different from the hearing population.

In spite of the greater prevalence of hard of hearing children, research in the area of LOC and hearing loss has focused almost entirely on the Deaf. While certainly Deaf
and hard of hearing students share many common experiences, there are some important differences as well. Hard of hearing children, who retain audition as a significant main mode of communication, represent a group with a greater range of disability and a different identity than do Deaf children who rely on mainly vision. Also hard of hearing students tend not to exhibit the degree of English language deficits that is common among Deaf children. In the current study, some students are hard of hearing, many are otitis prone with mild losses whose experiences are even more removed from those of the Deaf. Still, a review of the research on LOC and Deaf people offers the only information base from which hypotheses about children with histories of a hearing loss can be made.

There is also a great deal of research to be done on the LOC orientation of Native Indian children. It is incorrect to assume that generalizations can be made about North American Indian people as a homogenous group. Traditional Native Indian culture reflects a broad range of child rearing attitudes and practices across North America. Today, some Native Indian groups have been living for generations in proximity to large non-Indian populations, while others have received relatively little contact. This differing exposure may produce differences in the variables associated with LOC orientation. There appears to be no research on LOC and Canadian Native Indian populations. Native Indian people from the United States are the next most relevant group.

**Antecedents of Locus of Control**

Before beginning an examination of LOC and the two populations in this study, a brief look at the antecedents of LOC may be of some interest. Lefcourt (1976) produced an important book summarizing previous work on LOC. Not surprisingly, Lefcourt described the family as the most important institution in the development of LOC orientation. The child with an internal orientation tends to grow up in a home with high
expectations of independence. Training for independence is introduced early and a range of experiences are encouraged. Parents of the internal child tend to be more approving than critical. They are emotionally supportive, share activities with their children, are more suggestive and less directive. The external home by contrast is more critical, rejecting, neglectful and ignoring. While parents of the internal child may be more indulgent, they are also less protective. They offer their child the security of a nurturing home, but at the same time the freedom to explore. The child is then able to see the contingency between his/her own actions and ensuing events. Parents of internally oriented children tend to be strict but fair. Punishment is contingent on the child's behavior. Externally oriented children are associated with homes having a higher prevalence of authoritarian control, administered in a hostile way. Adults measured as having an internal LOC describe growing up in a warm nurturing home. The security provided by loving, non-threatening parents is especially necessary for the child to be able to internalize the responsibility for the negative reinforcement he receives. Lefcourt summarized familial conditions in this way, "Both pampered and neglected children. then, through lack of experience with contingent reinforcement, may fail to explore and discover the relationships between acts and outcomes from which beliefs in order of causal sequences develop" (1976, p.101).

For the purposes of this study, it is important to mention three additional variables often associated with LOC orientation.

First, an internal orientation is positively associated with adaptive social characteristics and outgoing personalities (Gilmor, 1978; Lefcourt, 1976). Internally oriented individuals are better able to see the contingency between their own behavior and the negative or positive reinforcement provided by others. This results in a greater sense of control over their social environment.
Second, an internal orientation is associated with higher academic achievement. Nowicki and Roundtree (1971), examined several variables with respect to academic success, LOC, popularity, involvement in extracurricular activities, family ordinal position and I.Q. They discovered that LOC had the strongest positive correlation with academic success for boys, while involvement in extracurricular activities correlated most highly with achievement for girls. Noting the date of the study, it would be interesting to see if perceptions held by girls have changed in recent years.

Lastly, LOC is not a rigid personality trait. Natural changes in LOC are associated with age (Lefcourt, 1976). Babies are heavily controlled, resulting in feelings of helplessness. As one's age increases, the perception that one is able to determine and shape one's life also increases resulting in a more internal LOC orientation.

**Locus of Control and The Deaf**

Several studies have focused on Deaf students attending colleges or universities. Generally, Deaf post-secondary students score more externally than do their hearing counterparts on LOC measures. Bodner and Johns (1977) compared the scores of 144 deaf students at post secondary institutions with a hearing population. They discovered that the Deaf students received significantly more external scores on the Rotter Internal-External scale than the comparison hearing group. Bodner and Johns further divided their Deaf population into quarters based on reading scores. Deaf students who scored in the upper 25% of the reading level distribution also scored more externally than the hearing comparison group. Bodner and Johns discovered no significant difference in the LOC scores of Deaf students who attended residential schools for the Deaf as compared to those who attended day programs.
Wolk (1985) attempted to go beyond a generalized statement on personality and investigated Gallaudet University Deaf students' perception of causal factors for academic success and failure. Each student was given one of four vignettes describing a successful or unsuccessful academic experience in the class of either a Deaf or hearing teacher. They were asked to attribute causes of the success or failure. Generally, internal causes, ability and effort, were rated as more important to success than external causes, such as luck and teacher skill. This group felt that effort was a greater factor for success with Deaf students than it was for hearing students. Teacher skill rated more highly as a contributor to success in the class of Deaf teachers than it did in the class of hearing teachers. Wolk concluded that attributions for success and failure for Deaf university students are very similar to those of hearing students.

In a related study, Wolk and Beach (1986) conducted research on 360 Deaf students at Gallaudet University. Students were given several vignettes describing situations involving academic failure or success and asked to attribute cause and solution. They concluded that an internal - external attribution for cause and solution varied as a result of the nature of the problem being considered. These researchers pointed out that on the whole their sample was more disposed to be internal. They argued that these results contradicted studies by other researchers suggesting that the Deaf are socialized to be external. However, Wolk and Beach did not effectively refute previous work. The vignettes in their study were not ego threatening and did not measure an individual's perception of his or her own life; nor was there a group of hearing students on which to base comparisons.

These two studies do raise one important issue however. It appears that when one examines differences within a group of Deaf students there are very similar patterns regarding the external - internal orientation of control as within a group of hearing students. In other words, when the two groups are viewed separately, the variables associated with internal or external orientation in Deaf people are the same variables we see associated with
internal or external orientation in hearing people. Another study supports this observation. Hayes-Scott (1987) discovered that academic motivation correlated positively with internality in LOC. This linkage is also present in hearing populations though Hayes-Scott pointed out that the correlation is stronger with the hearing than the Deaf.

Research on the LOC orientation of public school age Deaf students is also scattered and incomplete. Taken as a whole though, the same two trends appear to emerge with this Deaf population as with Deaf post-secondary students. First, Deaf public school age students tend to be more externally oriented than hearing students. Second, when examining differences within the Deaf population, it appears that many of the variables associated with internal - external orientation are similar to those found with the hearing population.

Convey and Koelle (1982), using a Rotter Internal-External scale revised for hearing impaired adolescents, discovered that Deaf subjects tended to be more externally oriented than their hearing counterparts. This conclusion was supported by Miller (1986) and Minter (1987), who found that Deaf students had a greater sense of externality on outcome of motor performance tasks compared to hearing students. Deaf students tended to attribute results to luck or the environment.

Several studies on public school age Deaf students demonstrated that factors, such as, achievement and maturity that are associated with an LOC orientation among hearing children are associated with the same orientation in Deaf children. Miller (1986) found that an internal orientation on the Nowicki-Strickland Locus of Control Scale for Children was related to high achievement in his investigation of Deaf elementary students. Blevins (1985) found that Deaf students with a more internal LOC score also scored higher on a career maturity scale. Heller (1986) discovered that LOC orientation in Deaf children could be enhanced by using telecommunications to improve literacy skills. Agrawal and Kuar
(1986) hypothesized that anxiety and overall adjustment would be positively related to external orientation of deaf children, ages 6 to 16, from two residential schools in Northern India. They assumed that stress tends to increase with maturity, social awareness and age. They expected that as students became older and more aware of their handicapped status they would become more external. They found no significant relationship between LOC, anxiety and adjustment level with this population. It seems then that, like their hearing peers, Deaf children become more internal with age.

The Measurement of Locus of Control Orientation in Deaf Populations

The lack of reliable measurement instruments has been problematic in the research of LOC in Deaf and Hard of hearing populations. The linguistic and experiential background of many Deaf people may result in unreliable data when conventional measurement devices are used. Bodner and Johns (1977) encountered this problem. Originally their study was to include data from a young Deaf group, ages 10 to 13, as well as an adult Deaf group. However the data from the young group needed to be discarded because of unreliability associated with reading difficulty. This illustrated the danger of using tests that may not match the linguistic and cultural experience of Deaf children. Fortunately some progress has been made. Two measures designed for use with Deaf populations have been developed.

Convey and Koelle (1982) modified the Rotter's Internal-External Scale to match more completely the syntax and vocabulary commonly used by Deaf high school students. They found that Deaf students scored more internally on this scale than on the original Rotter's. Also the revised scale was a more accurate predictor of academic achievement. Possible gains in prediction may have been made at the expense of content validity. Hearing students also tended to score more internally on the revised scale.
A LOC inventory for post secondary Deaf students was developed by Dowaliby, McKee & Maker (1983), The Locus of Control Inventory for the Deaf. Items were based on the Deaf individual's frame of reference and focused on academic situations. Construct validity was demonstrated by comparing this scale to The Intellectual Achievement Responsibility Scale and the Rotter Internal-external scale. The Locus of Control Inventory for the Deaf correlated significantly with the Intellectual Achievement Responsibility Scale. The Rotter's did not correlate as strongly, likely because of the abstract nature of this scale.

There has been no appropriate measure developed for use with the Deaf in elementary schools. The use of alternative media and communication modes may be worthy of exploration. The Nowicki-Strickland was translated into American Sign Language in Miller's (1986) study. Both the written and assigned form of the test were administered at the same time. Unfortunately information on possible increases of reliability and validity were not included in Miller's dissertation abstract. Still, alternatives such as this should be explored as they exploit the natural communication strengths of Deaf children and may be more reliable.

The Nowicki-Strickland Locus of Control Scale for Children (1973) has been modified for this study. A number of measures were examined, but the Nowicki-Strickland was chosen because the language level was most appropriate for use with young children. Details of the modification have been included in chapter three.

**Locus of Control and Hard of Hearing Populations**

There appears to be no published research on LOC and hard of hearing school children. McDavis (1983) studied LOC and an aging hard of hearing population. While the aged are certainly much different than children, they are the only other segment of society
that commonly experiences a non-congenital hearing loss. McDavis hypothesized that those people with an internal sense of control would demonstrate a greater denial of hearing loss especially in the mild to moderate range. However, she discovered no significant relationship between LOC, degree of hearing loss and the amount of denial manifested.

**Summary of the Research on the Deaf and Hard of Hearing and Locus of Control**

It has been argued that Deaf and hard of hearing Children represent a high risk group in terms of developing a socially functional LOC orientation (Bodner & Johns, 1977; Agrawal & Kuar, 1985). Deaf and hard of hearing children experience a certain amount of discrimination which results in sense of lost control. Also, with their sensory loss, it is difficult for them to perceive themselves in control of events. Last, parental child rearing styles often associated with hearing parents of Deaf and Hard of hearing children tend to produce an external orientation. Parents are often over-protective of their Deaf child (Meadow, 1980; Schlesinger, 1985) leaving the child with a sense that their world is controlled from the outside.

As we have seen, the research on LOC and hearing loss remains incomplete and it contains several problems. To begin, there is a disproportionate amount of work using post secondary students. This group is not representative of the general Deaf population. Academic success is associated with greater internality. Post-secondary students are adults with more fully formed personalities. Educators need to know more about the school age children and the antecedents of LOC at that level. Second, there has been little consideration given to factors outside of deafness that contribute to LOC such as socio-economic status or culture of the home. Third, matched comparison groups of hearing subjects have never been used. Studies that have made comparisons have relied on data that have been built through
multiple uses of a certain measurement instrument. Fourth, there has been no broad based exploratory investigation to see which variables correlate most strongly with the LOC orientation of the Deaf. The few scattered studies that do exist are beginning to piece together a description of LOC and deafness but the process is slow and incomplete. A correlational study with a broad spectrum of variables would explore relationships thoroughly and efficiently resulting in an acceleration of the overall process of investigating LOC and hearing loss. Last, all studies on populations labelled hearing impaired have in fact focused on the Deaf.

While similar, Hard of hearing children represent a different population. They still rely mainly on audition for communication and most often identify with the hearing, not the Deaf. The age of diagnosis is often later. In fact many hard of hearing children are not diagnosed until they enter school. Treatment and educational histories differ as well. Finally, because the deaf rely mainly on vision as the main mode of communication, there is, in fact a greater range of disability among the hard of hearing who rely mainly on audition.

In terms of the focus of this study, we can say with confidence that, as a group, Deaf people score more externally than hearing people on LOC measures. However, there have been no studies on the opposite end of the hearing loss spectrum. We don't know if a mild hearing loss is generally associated with an external LOC orientation or not.

**Locus of Control and Native Indian Students**

As is the case with the Deaf, there are some trends emerging in the research on LOC and Native Indian people, but there is a great deal of work left to do. It appears that on the whole, Native Indian people are more disposed to be external compared to the majority
culture but the antecedents of this orientation are still to be explored. Only recently have researchers begun to examine differences between and within Native Indian groups.

Several studies have brought forth evidence supporting the conclusion that Native Indian students are generally more external than non-native students. Tyler and Holsinger (1975) compared the LOC orientation of Indian students in grades 4, 7, 9, and 11 attending a reserve school to an equivalent white group. They discovered that as a group, Native Indian students were more external than white students. Among Native Indian children, internality increased with age. Unfortunately little information was given about the comparison white group other than they were from a town thirty miles away. Their relatively greater degree of internality may have been explained in part or in whole by other factors such as degree of urbanization or socio-economic status. The general finding that Indian people are more disposed to be external has been confirmed in other studies (Guagnano et al., 1986; Shorr & Young, 1984; Spence, 1987).

Halpin, Halpin and Whiddon (1980) attempted to explore the dynamics of this difference in more detail. They compared parental child rearing attitudes for Indian and non-Indian people. The authors hypothesized that LOC orientation might be associated with different factors within the different groups. That is, Native Indian children may be internal or external for different reasons than white children. They concluded that, with the populations they were examining, there were no significant differences in Indian and white child rearing practices that influenced LOC orientation. They speculated that the reason for this may be due to the "Americanization" of Indian people. This study used a measure called the Perceived Parenting Questionnaire, which taps children's perception of their parents' child rearing attitudes. This is certainly not as accurate as directly measuring parent's attitudes or better still, observing them. It would be interesting to replicate this study with Indian people from a more remote region and therefore less influenced by modern societal attitudes and values.
Powers and Rossman (1984), also investigated the details of the difference in LOC orientation between the two groups. They compared attributions for school achievement of Native Indian and caucasian community college students enrolled in remedial reading programs. Using the Multi-dimensional-Multiattributinal Causality Scale they discovered that Native Indian students attributed their achievement more to effort than did Caucasians. Indian students who attributed their success to ability tended to be more achievement motivated. The authors suggested that the greater attribution of failure to lack of effort may be associated with greater frustration for Native Indians than for Caucasians. Continued low achievement coupled with greater attribution to lack of effort may lead to lack of motivation and lowered expectancy of success for Native Indians relative to Caucasians.

Recently research has moved away from the assumption that LOC is a product of ethnicity and focused on the common threads associated with LOC across several ethnic groups. Shorr and Young (1984) examined the relationship between LOC and age, sex, ethnicity, socio-economic status and academic achievement with White, Black, and Native Indian children. They discovered that socio-economic status was a significantly greater correlate of LOC orientation than ethnicity. Guagnano et el (1986), addressed the need to examine S.E.S., ethnicity and L.O.C. by including a broad base of demographic variables and a large sample of White, Black, Hispanic, Asian-American and Native American adolescents and adults. Using multivariate analysis they discovered that the main effects for income and ethnicity were significant. Also significant, but less powerful, was the combination of education, income and ethnicity and sex, income and ethnicity. When univariate analysis was used they found that S.E.S was more important than ethnicity when age, gender, income and education were controlled. On the whole, income was found to be the most strongly related to LOC. When other demographic variables were controlled they did not find differences in overall LOC orientation between White, Black, Hispanic people, though they did find that Indian people had a significantly more external orientation of control. Unfortunately the size
of the Indian sample was relatively small and no background information was supplied for this group.

Some work has examined the factors associated with LOC variation within the Indian population. Butler-Allen (1990), discovered that there was no correlation between LOC orientation and the expectation of taking part in higher education for adult Cherokee Indians. Halpin, Halpin and Whiddon (1985) examined the effects of success and failure on the level of aspiration on a group of American Native Indian children. They discovered that the tendency to lower aspirations after failure was not moderated by LOC orientation. Young (1991) concluded that depression was positively associated with an external orientation for those Native Indian people who could not express their anger physically or verbally. Immerman (1983), compared LOC orientation between the Navajo and Pueblo Indians of New Mexico. He discovered that there was no significant difference between LOC and sex, tribal affiliation and first language with these two populations. The Navajo and Pueblo people reside in the same geographic region and their exposure to non-native culture is similar. Spence (1987), compared Indian groups from more divergent backgrounds. His study of Native Indian students at the University of Washington discovered that native students from Alaska were more internal than those from the Seattle area.

**Summary of the Research on Native Indian Students and Locus of Control**

On the whole Native Indian students are more external than their non-Indian peers but little is know about the reasons for this. It appears that this is the result of factors other than ethnicity. Indian people are likely not traditionally socialized to be external but rather their externality is a result of such things as income or SES. There is little understanding of the variables associated with LOC within Native Indian people. The development of an LOC orientation may well be dependent on different factors than those
commonly found in the majority culture. The factors associated with LOC orientation within Native Indian groups likely varies a great deal from one Native Indian group to the next. Very little work has been done on Indian people from remote regions where contact with non-Indian culture has been relatively limited.

Educators in Canada must be careful not to over generalize the results of research on Native Indian People from the United States. American Indians' greater degree of exposure and therefore acculturalization to majority norms may have resulted in experiences and perceptions that are significantly different than those of many Canadian Native Indians. Indeed, within Canada generalizations about Native Indian people as a whole must be made with caution. The historical experiences and the present conditions of Canadian Native Indian people residing in remote communities are very different than those of Native Indian people residing in or near large cities. Traditional culture of Native Indian groups is also highly varied across the country. Researchers must be prepared to examine the characteristics of each Indian group separately in order to draw confident conclusions.

**Hearing Loss and Native Indian Children**

When one examines the topic of Deaf and hard of hearing Native Indian children the dearth of research becomes even more apparent. Scaldwell and Fraume (1985) examined the incidence of otitis media among Native Indian students from pre-school to grade eight in six Ontario communities. Otitis media can cause permanent damage to the tympanic membrane and ossicles, resulting in a mild or moderate hearing loss. In extreme cases sensori-neural damage can result. These authors discovered that 21.6% of the children in this group suffered from otitis media in pre-school. For a further 14.8%, evidence could be found that they had suffered sometime in the past. The percentage diminished with age and at the grade eight level 6.5% suffered from otitis media and 19.3 % displayed symptoms
of the disease in the past. The authors pointed out that otitis media is likely to have an impact on language acquisition because of its prevalence in younger children. Scaldwell (1989) investigated the linkage between Otitis media and learning problems in a follow up study. He demonstrated that reading scores in a group of Native Indian children with otitis media were lower than those Native Indian students who had no history of the disease. Those students showing signs of previous severe attacks of otitis media received the lowest scores in this study. Thus otitis media represents more than a medical problem but also a serious educational problem for Native Indian children. It also means that among Native Indian children the percentage with a hearing loss is far higher than normal.

This is an important conclusion. Native Indian children from Northern Canada with histories of a hearing loss comprise a broad range of possible impairment, from a few with a severe or profound sensori-neural loss to many who are otitis prone. The latter category, because of its perceived lack of severity, has received very little attention. It appears, from this initial research, that there is a great need to gather information and evolve adequate educational services for all Native Indian children with histories of a hearing loss.

**Otitis Media and Child Development**

Otitis prone students are an intriguing population to study. The severe and profound hearing losses associated with deafness produce substantial, consistently measurable differences between Deaf and hearing populations in a spectrum of psycho-educational spheres. But what about the relatively mild, temporary losses associated with otitis prone children? This is the other extreme of the hearing loss continuum to deafness, where the condition is associated with subtle, less easily recognized differences. The educational, behavioural and psychological characteristics of this population are only starting to be understood.
The examination of the research on otitis media has been divided into two sections. To begin, there is a brief review of key articles dealing with the effect of otitis media and linguistic and cognitive development followed by a an examination of the articles reporting on otitis media and behavior.

A thorough examination of otitis media and linguistic or cognitive development is outside the scope of this study. However, a review of key articles can provide valuable information on how best to approach this population for testing purposes. Also, given that bulk of research on otitis media focuses almost entirely on linguistic and cognitive development, this represents the only pool of knowledge on which general predictions on otitis media and child development can be made.

All studies approach an examination of otitis media assuming that the first few years represent a critical or at least optimal period for language development (Feldman & Gelman, 1986). While otitis media is not as severe as a permanent pure tone loss its effects may be amplified because it most frequently occurs in the early years of life.

Empirical research on the impact of otitis media and cognitive and linguistic development has produced mixed results. While some studies have been able to demonstrate that an association exists others have not been successful. In an extensive review of the literature Roberts and Schuele (1990), reported that otitis media prone children scored lower than a normal population in the area of verbal intelligence in five out of nine studies. Seven out of fifteen studies reported that otitis media prone students scored significantly lower on academic sub-tests for reading and spelling and four out of nine studies reported similarly lower scores for math.

Zinkus, Gottlieb and Schapiro (1978) were among the first researchers to examine the association between otitis media in early childhood and subsequent language and intellectual delays. They identified two groups of children, one group had experienced
chronic and recurring otitis media in the first three years of life. The other group had experienced mild otitis media during the first three years of life. The researchers discovered some significant differences exist between the two groups. A parent interview revealed that the children from the chronic group were delayed in the major areas of speech and language development as compared to the mild group. Intelligence testing revealed differences in verbal and non-verbal intelligence, however an examination of sub-tests indicated that this was a result of lower ability in tests requiring auditory processing. In terms of academic skills the chronic group was relatively deficient in decoding and spelling scores. Both groups were deficient when compared to the general norm.

Silva, Kirkland, Simpson & Stewart (1982), compared forty-seven, five year old otitis media children to 355 five year old, normal children. They found significant differences between the two groups in language, speech articulation, motor development between otitis media and normal children. This study was followed up in two year intervals until the children reached the age of eleven (Silva, Chalmers & Stewart, 1986). The differences diminished in subsequent years. The second study included some results collected on reading ability between the two groups. There were significant differences in Z scores at ages 7, 9 and 11.

Friel-Patti and Fintitzo (1990) studied the association of otitis media with effusion in the first two years of life and language development. The strength of this study is that it was prospective and longitudinal. Two groups were identified, one with mild otitis media in the first two years of life and one with chronic and recurring otitis media with effusion. Hearing levels were measured at ages 6, 12, 18 and 24 months. Language was evaluated using the sequenced Inventory of Communication Development. The authors discovered that days with effusion caused by otitis media and language performance correlated negatively at age 12 months, \( r = -0.20 \), and again at age 18 months, \( r = -0.13 \). Other correlations were not significant. When hearing loss was averaged and compared to language
development negative correlations also appeared, at 12 months, \( r = -0.17 \), at 18 months, \( r = -0.16 \) and at 24 months, \( r = -0.17 \). The authors concluded that there is a direct connection between hearing and language and an indirect causal connection between otitis media with effusion and language based on the relationship between otitis media with effusion and hearing. Better language is associated with better hearing and fewer days of effusion.

Other studies have not been able to establish an association between a history of otitis media and delayed language acquisition or cognitive development. Bishop and Edmundson (1986) hypothesized that a Learning Disabled (LD) population would contain more students with histories of Otitis media than a normal population. They examined language disordered students and identified an otitis media group within this larger population. These researchers discovered that there was no significant difference between the two groups with regards to severity, pattern and prognosis of language disorder. Where a child presents a specific developmental language disorder and a history of otitis media it is tempting to attribute the delay to otitis media but the evidence presented in this study cannot support this conclusion.

Tallel, Curtis and Allard (1991), had similar results. They also investigated LD children who also suffered from recurring otitis media and compared this group to the larger population of LD children. They found few differences across a number of domains between LD students with a history of Otitis media and LD students with normal hearing. The only exception was academic performance where the otitis media students actually fared better than the larger LD population. The authors concluded that otitis media cannot be seen as a primary factor in the development of language disorders. The authors admit small n's may have been a factor, influencing the results of this study.
Otitis Media and Behavior

There has been less work done on otitis media and behavior compared to otitis media and language and cognitive development. However, several studies include behavioral considerations in their list of factors being examined. There are several reasons to think that otitis media may be associated with behavior or emotional difficulties. Certainly frustration and misunderstanding arising from communication impairment may encourage behavior problems. Also frustration associated with poor academic performance may cause problems. Feeling sick during bouts of otitis media may limit social interaction, reducing experience and a knowledge base on which to develop ideas about the world.

Silva et al. (1982) included behavioral considerations in their study. Using a questionnaire, teachers reported that otitis media children are more dependent, have shorter attention spans and show weaker goal orientation than normal children. They were reported by their parents as being more restless, fidgety, destructive, less popular, and more often disobedient. Follow up studies at two year intervals revealed a gradual diminishment of the differences between the two groups (Silva et al, 1986).

Roberts and Schuele (1990) reported that otitis media children are retained in grade one more often and that attention and behavior problems are more common among this group.

Funk and Jones (1986), demonstrated through a review of the literature, that students with language disorders have a greater risk in developing behavior disorders. The authors hypothesized that children with chronic otitis media are also at risk for behavior problems, because of the language disorders often associated with this condition. Twelve students, ages 45-65 months, with at least a six month delay in speech and language acquisition and a general delay in performance on language tests of one standard deviation
were selected. Using the Louisville Behavior Checklist, Funk and Jones discovered that this otitis group contained significantly more behavior problems compared to the general norms presented with these sub-scales: intellectual deficit, cognitive disability, immaturity, prosocial deficit. The authors also noted that when compared to teachers' ratings, parents' tended to describe the children as having more behavior problems.

**Summary of the Research on Otitis Media**

At first glance, information exploring the relationship between otitis media and linguistic, cognitive and behavioral development seems a little removed from a study of otitis media and locus of control orientation. But this knowledge does provide insights for approaching an otitis prone population and developing hypotheses.

Despite the lack of consistency in the results on Otitis media and linguistic and cognitive development, the research does raise enough concern to approach this population with some caution when testing. Certainly ensuring that a measure of LOC orientation is presented at an appropriate language level is important. In the case of the present study this meant rewriting the Nowicki-Strickland LOC measure to simplify the language and even reading the items to younger children to ensure comprehension.

To date there have been no studies examining the relationship between otitis media and LOC. The knowledge gathered by previous studies on otitis media and cognitive, linguistic, academic and behavioral performance offers some important information when developing hypotheses on the relationship between otitis media and LOC orientation. It appears to be a topic worthy of attention for several reasons. An external orientation has been associated with poor academic performance as has recurring otitis media. The feeling of being sick during bouts of otitis media and a withdrawal from social interaction associated
with that may have an impact on a child's perception of his or her influence on the environment. Experiences in the classroom may also contribute to an external orientation. The shorter attention span and weaker goal orientation associated with otitis media as reported in the literature may encourage teachers to give these kinds of students less latitude in decision making than they may with other students. In the home, parents have reported children with a history of chronic otitis media as tending to be restless, fidgety, destructive and disobedient. These factors may contribute to a feeling of tension in the home and a more controlling approach by parents. Lastly, a greater external orientation has been associated with deafness, it would be interesting to see if temporary hearing impairment due to otitis media is strong enough to be associated with significant differences in LOC orientation.

**Summary**

Generally, very little is known about the quality and the formation of LOC in Native Indian children with histories of a hearing loss. The main purpose of this study was to determine if Native Indian children with mild or temporary hearing losses differed significantly from normally hearing Native Indian children on LOC orientation.

Native Indian children with histories of a hearing loss in remote Canadian communities are a unique population with a special cultural and linguistic background. Little is known of how a native and hearing loss background acts and interacts with a LOC orientation. Most importantly this population represents a level of hearing loss that is at the opposite end of the spectrum to deafness. While it has been proven that Deaf populations are more generally external than normally hearing populations, no one knew what level of hearing loss is necessary to produce this significance. Perhaps a mild or temporary loss due to recurring otitis media has a significant association. The present study explored that relationship.
CHAPTER III - METHOD

Design

Two broad designs were used in this study, depending on which variables were being compared, a causal-comparative design using ANOVA and a correlational design using the Pearson product moment correlation coefficient. A modified LOC measure was administered to 90 Carrier-Sekani students ranging in age from 9 to 19. The sample had been divided into a group of students with a history of a hearing loss and a matched group of normally hearing students. LOC scores were then compared with academic achievement scores, age and hearing status.

This study came under the umbrella of a larger study called the Carrier-Sekani Hearing Impairment Project headed by Dr. P. Leslie. A range of data were collected from 185 subjects on such variables as academic performance, I.Q., demographics, personality, and audiological history. The independent variables used in comparisons with LOC scores came from this larger study.

Hypotheses:

1. An internal orientation of LOC correlates positively with academic achievement for both normally hearing students and students with histories of a hearing loss.

2. As a group, students with histories of a hearing loss are significantly more externally oriented than normally hearing students.

3. As a group, students with a mild or greater pure tone hearing loss are significantly more externally oriented than all other students participating in the study, including
those with a recurrent history of otitis media, those displaying negative pressure and normally hearing students.

4. As a group, otitis prone students are significantly more externally oriented than normal hearing students.

5. An internal LOC orientation correlates positively with age for both normally hearing students and students with histories of a hearing loss.

The inclusion of this study in a larger wide ranging research project provided demographic data that allowed for some valuable post hoc analyses. The purpose of this analysis was to determine generally if the types of variables associated with LOC orientation in the majority culture were also present in this population. While no specific hypotheses were developed it was thought that relationships might exist in the following areas:

1. Place in the family
2. Income
3. Number of parents in the home.

All of the above variables have been the focus of attention in previous research except for the last one, number of parents in the home. It was chosen to see if the absence of one family member influenced child rearing conditions to an extent that it was reflected in LOC orientation.

**Subjects**

A total of 177 boys and girls, in grades K. to 12, aged 5 to 18, took part in the Carrier-Sekani project. They came from 21 different schools and lived in communities ranging from a city of 70,000 to small isolated villages.
Each Carrier-Sekani student in the region received a pure tone audiologic screening test from a nurse or a trained research assistant. Students were tested using the following frequencies and intensities: 500Hz–25dB, 1000Hz–20dB, 2000 Hz–20dB, 4000Hz–25dB. Students who failed one frequency in either ear were screened again. Those who failed the second screening test were referred for complete audiologic testing. This included a pure tone test, impedance testing and a speech reception test. Students were also referred to the audiologist when they had a known history of hearing problems, recurring colds or upper respiratory problems. When students met two of the following four criteria they were included in the experimental group:

1. conductive hearing loss, either unilateral or bilateral
2. significant negative ear pressure
3. history of recurrent ear infection/upper respiratory infection
4. scarring or inflammation of the tympanic membrane.

For the larger project, a matched group of normally hearing children based on age, classroom and gender was established from students who did not fail the original screening test.

A total of 90 students received the LOC measure. Students under the age of nine did not receive the test. Absences and logistical considerations prevented others from receiving the measure. Of the 90 students who received the LOC measure, there were audiological data on 80. Forty-five of these students were categorized as having histories of a hearing loss, 35 were normally hearing. For those with histories of a hearing loss, a further 32 were categorized as suffering from recurring otitis media, as evidenced by scarring of the tympanic membrane, 36 were identified as having a pure tone loss of 20 dB or greater and 32 registered negative ear pressure. Students were members of more than one sub-category.
Instrumentation

A modified Nowicki-Strickland Locus of Control Scale for Children was used to assess internal-external orientation. The original scale, published in 1973, was a forty-item pencil and paper test having a Yes-No response mode. It could be administered to an entire class at one time. Estimates of internal consistency via the split-half method corrected by the Spearman-Brown prophecy formula averaged \( r = .72 \). Test-retest reliability averaged .67. Construct validity was demonstrated by a comparison with the Intellectual Achievement Responsibility Questionnaire which measures the child's beliefs in intellectual - academic situations. Correlations of \( r = .30 \) and \( r = .51 \) were computed for third and tenth grade black students. A correlation of .41 was found with the Bailer-Cromwell Scale which measures a general LOC orientation.

The Nowicki-Strickland required some moderate item modification to account for the cultural and linguistic experience of the population being examined in this study. Some items made little sense given the cultural background of Native Indian children from Northern British Columbia. For example, item 21 refers to a four leaf clover producing good luck, a foreign association in the cultural context of this population. In one or two cases colloquial expressions needed to be regionalized. While the Nowicki-Strickland has been designed to be used as low as the grade three reading level some items needed to be simplified even further due to the expected language delay of children with histories of a hearing loss and those from English as a second language backgrounds. The rules for item editing used by Koelle and Convey (1982) served as a guideline. Last, it is important to be explicit about the sensitive nature of this research. Items were changed or eliminated that may offend Native Indian parents and therefore cause general rapport problems between researchers and the community. Adaptation was carried out with caution and only where necessary, insuring that the meaning of each item remained intact. As a result of this
modification a 34 item scale was administered to the study population. Both the original scale and the modified scale have been presented in Appendix A.

Reliability was checked after the test was administered and the data had been collected. Four items were discovered to influence the over-all reliability negatively. After these items had been eliminated, the reliability coefficient for Cronbach's Alpha was .6009 and the Standardized Item Alpha was .6028. These formulae are the equivalent of the Kuder-Richardson 21 in the Statistical Package for Social Sciences and appropriate analyses for determining the internal consistency of yes-no response measures. While these reliability coefficients are not as high as those reported by Nowicki and Strickland, they are still well within accepted limits.

The Stanford Achievement Test For the Hearing Impaired (SATHI), 1990 edition, was used to assess achievement. This test was developed by the Center for Assessment and Demographic Studies at Gallaudet University and standardized on a random sample of 6,871 hearing impaired children across the United States. For the purposes of this study the standard scores from the Reading Comprehension and Math Computation subtests of the SATHI were used.

**Procedure**

The LOC measure was administered to students with histories of a hearing loss and normally hearing students. The test was read out loud to students if they had difficulty reading English. All students completed the test individually in the presence of a researcher. Demographic data for the independent variables were gathered by local band members through interviews in the students' homes. Achievement tests were administered by researchers as part of the larger study.
Analysis

Pearson product-moment correlations were computed to assess the significance of relationships between LOC orientation, chronologic age and academic performance. An analysis of variance was used to assess the significance of differences in the mean LOC scores among the various categories of hearing impairment. An analysis of variance was also used in the treatment of LOC orientation and demographic variables. When ANOVA indicated that significant differences existed, the Tukey method was employed to identify which pairs of means were involved. An alpha level chosen for all analyses was .05. The Statistical Package For Social Sciences, Extended Version Release 3.0, was used for the computer analysis of all the statistics.
CHAPTER IV - RESULTS

Ninety students received the locus of control (LOC) measure but there are not complete data for all of these students on hearing status, chronologic age and academic achievement and consequently some cases were eliminated. The number of cases remaining varied from 80 to 84 depending on which variable was being compared to locus of control.

**Locus of Control Orientation and Achievement**

It was hypothesized that an internal orientation of LOC would correlate positively with academic achievement. This hypothesis received partial support. Pearson zero-order product moment correlation coefficients were computed to assess the relationship. Academic achievement was measured by using the mathematics and reading sub tests of the Stanford Achievement Test, Hearing Impaired version. On the LOC measure a low score indicates an internal orientation and a high score an external orientation. A strong internal orientation correlates negatively with a high achievement score. While a significant negative correlation was computed for LOC orientation and reading scores ($r = -.374$, $p < .001$) the relationship between LOC and mathematics performance was not significant ($r = -.122$, $p .134$). The results are presented in Tables 1 and 2.
Table 1. Descriptive statistics for LOC orientation and achievement.

<table>
<thead>
<tr>
<th>Variable</th>
<th>n</th>
<th>Mean</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOC</td>
<td>90</td>
<td>43.244</td>
<td>4.023</td>
</tr>
<tr>
<td>SATHI - Math</td>
<td>151</td>
<td>23.49</td>
<td>11.426</td>
</tr>
<tr>
<td>SATHI - Reading</td>
<td>130</td>
<td>27.385</td>
<td>10.926</td>
</tr>
</tbody>
</table>

Table 2. Pearson Correlation Coefficients for LOC orientation and academic achievement

<table>
<thead>
<tr>
<th></th>
<th>SATHI Math</th>
<th>SATHI Reading</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOC Orientation</td>
<td>-.122</td>
<td>-.374</td>
</tr>
<tr>
<td>p</td>
<td>.134</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>n</td>
<td>84</td>
<td>80</td>
</tr>
</tbody>
</table>

Locus of Control Orientation and Hearing Status

Participants were placed into two major hearing status categories: students with histories of a hearing loss and normally hearing students. The category of students with histories of a hearing loss was further broken down into those displaying negative ear pressure at the time of testing, those with a history of recurring otitis media and those displaying a pure tone loss. Students described as otitis prone could either display negative

2. A scatterplot was computed for math achievement and LOC scores. No relationship was indicated. Please see appendix III
ear pressure or have a history of recurring otitis media. Students could be members of more than one sub-category.

An analysis of variance was used to determine the significance of differences among the various groups. A .05 level of significance was deemed appropriate. The three hypotheses involved in this analysis are as follows:

1. As a group, students with histories of a hearing loss are significantly more externally oriented than normally hearing students.

2. As a group, students with a mild or greater pure tone loss are significantly more externally oriented than other students participating in the study, including those with a recurrent history of otitis media, those displaying negative pressure and normally hearing students.

3. As a group, otitis prone students are significantly more externally oriented than normally hearing students.

**Main Effects**

No significant differences in the mean LOC scores of the groups in this study were revealed by these analyses.

The means of the two main hearing status categories, students with histories of a hearing loss and normally hearing students, were not found to be significantly different. Students with histories of hearing loss had a mean score of 43.53, while normally hearing students had a mean score of 42.46.
The mean score for those students with a pure tone loss, 43.58, was not significantly more external than the mean score for those students without a pure tone loss, 42.64.

The mean score for those students with histories of recurring otitis media, 43.59, was not significantly greater than the mean for those students without this history, 42.71, or for normally hearing students, 42.46.

The mean score for those students registering negative ear pressure, 43.69, was not significantly different from those students without this condition, 42.65, or from normally hearing students, 42.46.

The three hypotheses must be rejected. It appears, that for children in this sample a mild pure tone loss or a temporary hearing impairment caused by otitis media, does not have a significant association with LOC orientation. The results are presented in Tables 3 and 4.
<table>
<thead>
<tr>
<th>Hearing Status</th>
<th>History of a loss</th>
<th>Normal</th>
</tr>
</thead>
<tbody>
<tr>
<td>mean</td>
<td>43.53</td>
<td>42.78</td>
</tr>
<tr>
<td>S.D.</td>
<td>3.34</td>
<td>4.3</td>
</tr>
<tr>
<td>n</td>
<td>46</td>
<td>37</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pure tone loss</th>
<th>Observed</th>
<th>Not Observed</th>
</tr>
</thead>
<tbody>
<tr>
<td>mean</td>
<td>43.578</td>
<td>42.64</td>
</tr>
<tr>
<td>S.D.</td>
<td>3.53</td>
<td>3.9</td>
</tr>
<tr>
<td>n</td>
<td>37</td>
<td>44</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Recurring otitis media</th>
<th>Observed</th>
<th>Not Observed</th>
</tr>
</thead>
<tbody>
<tr>
<td>mean</td>
<td>43.58</td>
<td>42.71</td>
</tr>
<tr>
<td>S.D.</td>
<td>3.43</td>
<td>3.94</td>
</tr>
<tr>
<td>n</td>
<td>33</td>
<td>48</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Negative ear pressure</th>
<th>Observed</th>
<th>Not Observed</th>
</tr>
</thead>
<tbody>
<tr>
<td>mean</td>
<td>43.69</td>
<td>42.65</td>
</tr>
<tr>
<td>S.D.</td>
<td>2.63</td>
<td>4.33</td>
</tr>
<tr>
<td>n</td>
<td>32</td>
<td>48</td>
</tr>
</tbody>
</table>
Table 4. Analysis of Variance of LOC scores by hearing status category and sub-category

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Sum of Squares</th>
<th>DF</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig. of F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main Effects</td>
<td>26.894</td>
<td>4</td>
<td>6.724</td>
<td>.462</td>
<td>.763</td>
</tr>
<tr>
<td>Hearing Status</td>
<td>.104</td>
<td>1</td>
<td>.104</td>
<td>.007</td>
<td>.933</td>
</tr>
<tr>
<td>Pure Tone Loss</td>
<td>1.108</td>
<td>1</td>
<td>1.108</td>
<td>.076</td>
<td>.783</td>
</tr>
<tr>
<td>Recurring O.M.</td>
<td>.442</td>
<td>1</td>
<td>.442</td>
<td>.030</td>
<td>.862</td>
</tr>
<tr>
<td>Negative Pres.</td>
<td>3.170</td>
<td>1</td>
<td>3.170</td>
<td>.218</td>
<td>.642</td>
</tr>
<tr>
<td>Explained</td>
<td>26.894</td>
<td>4</td>
<td>6.724</td>
<td>.462</td>
<td>.763</td>
</tr>
<tr>
<td>Residual</td>
<td>1091.793</td>
<td>75</td>
<td>14.557</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>1118.687</td>
<td>79</td>
<td>14.161</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Locus of Control Orientation and Chronologic Age**

It was hypothesized that an internal LOC orientation correlates positively with chronologic age for both students with a history of a hearing loss and those with a normally hearing history. The mean age in months for this sample was 134.476, S.D. = 38.211. A Pearson Correlation Coefficient was computed to assess this relationship. The hypothesis was supported. Among this population an internal LOC orientation increases significantly with chronologic age, $r = -.2046$, $p < .05$, $n = 83$. 
Locus of Control Orientation and Additional Demographic Variables

This study focused primarily on the relationship between LOC orientation and hearing status. However, additional demographic data collected on this population were also available. While no specific hypotheses were generated, it was possible to run tests making comparisons between LOC orientation and number of parents in the home, family income, and place in the family. An analysis of variance was used with all three of these categories to see if significant differences between means existed. The Tukey method was used as a post hoc test to determine more specifically which pairs of means were significantly different. A .05 level of significance was established for all analyses.

Locus of Control Orientation and Number of Parents in the Home

Students were classified as living with: one parent, two parents, a guardian or other. An analysis of variance demonstrated that significant differences existed between the mean LOC scores of these three categories. Using the Tukey method, it was discovered that students from one parent families scored significantly more externally on the LOC measure than students from two parent families. There were no significant differences among the other groups. Table 5 presents the mean scores and Table 6 the results of the analysis of variance for LOC orientation and number of parents in the home.
Table 5. Mean LOC scores by parents in the home

<table>
<thead>
<tr>
<th></th>
<th>1 parent</th>
<th>2 parents</th>
<th>guardian</th>
<th>other</th>
</tr>
</thead>
<tbody>
<tr>
<td>mean</td>
<td>46.00</td>
<td>42.64</td>
<td>44.50</td>
<td>47.00</td>
</tr>
<tr>
<td>S.D.</td>
<td>2.83</td>
<td>3.78</td>
<td>1.52</td>
<td></td>
</tr>
<tr>
<td>n</td>
<td>11</td>
<td>33</td>
<td>6</td>
<td>1</td>
</tr>
</tbody>
</table>

* Tukey Honestly Significant Difference = 2.418

Table 6. Analysis of variance of LOC scores by parents in the home

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Sum of Squares</th>
<th>DF</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig of F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main Effects (Parents)</td>
<td>110.197</td>
<td>3</td>
<td>36.732</td>
<td>3.144</td>
<td>&lt;.05</td>
</tr>
<tr>
<td>Explained</td>
<td>110.197</td>
<td>3</td>
<td>36.732</td>
<td>3.144</td>
<td>&lt;.05</td>
</tr>
<tr>
<td>Residual</td>
<td>549.136</td>
<td>47</td>
<td>11.684</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>659.333</td>
<td>50</td>
<td>13.187</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Locus of Control Orientation and Family Income

Families described themselves as receiving high, medium or low incomes. An analysis of variance indicated that significant differences existed between the mean LOC scores of children from these three different family income categories. Using the Tukey method, it was determined that students coming from families that described themselves as having a medium income were significantly more internally oriented than students coming from families that described themselves as having low incomes. Students from families describing themselves as high income, of which there were only two, did not differ
significantly from either of the two other categories. The results of this analysis are presented in Tables 7 and 8.

### Table 7. Mean LOC scores by family income

<table>
<thead>
<tr>
<th></th>
<th>High</th>
<th>Medium</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td>mean</td>
<td>41</td>
<td>42.77</td>
<td>45.37</td>
</tr>
<tr>
<td>S.D.</td>
<td>7.07</td>
<td>3.68</td>
<td>2.6</td>
</tr>
<tr>
<td>n</td>
<td>2</td>
<td>30</td>
<td>19</td>
</tr>
</tbody>
</table>

*Tukey Honestly Significant Difference = 2.428

### Table 8. Analysis of variance of LOC scores by family income

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Sum of Squares</th>
<th>DF</th>
<th>Mean Squares</th>
<th>F</th>
<th>Sig of F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main Effects (Income)</td>
<td>93.546</td>
<td>2</td>
<td>46.773</td>
<td>3.968</td>
<td>&lt;.05</td>
</tr>
<tr>
<td>Explained</td>
<td>93.546</td>
<td>2</td>
<td>46.773</td>
<td>3.968</td>
<td>&lt;.05</td>
</tr>
<tr>
<td>Residual</td>
<td>565.788</td>
<td>48</td>
<td>11.787</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>659.333</td>
<td>50</td>
<td>13.187</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Locus of Control Orientation and Place in the Family**

Students were asked to identify their place in the family relative to the age of other siblings. For the purposes of this analysis they were then grouped into first born, second born, and third born or greater. An analysis of variance revealed no significant differences in the means of these groups. The results have been presented in Tables 8 and 9.
Table 9. Mean LOC scores by place in the family

<table>
<thead>
<tr>
<th></th>
<th>First</th>
<th>Second</th>
<th>Third or Greater</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>42.42</td>
<td>44.08</td>
<td>44.04</td>
</tr>
<tr>
<td>S.D.</td>
<td>5.05</td>
<td>2.29</td>
<td>3.41</td>
</tr>
<tr>
<td>n</td>
<td>12</td>
<td>13</td>
<td>26</td>
</tr>
</tbody>
</table>

Table 10. Analysis of variance of LOC scores by place in the family

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Sum of Squares</th>
<th>DF</th>
<th>Mean Squares</th>
<th>F</th>
<th>Sig of F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main Effects (Place)</td>
<td>24.532</td>
<td>2</td>
<td>12.266</td>
<td>.927</td>
<td>.403</td>
</tr>
<tr>
<td>Explained</td>
<td>24.532</td>
<td>2</td>
<td>12.266</td>
<td>.927</td>
<td>.403</td>
</tr>
<tr>
<td>Residual</td>
<td>634.801</td>
<td>48</td>
<td>13.225</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>659.333</td>
<td>50</td>
<td>13.187</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Summary of Results

For this sample, LOC scores are significantly, positively correlated with chronologic age and reading achievement scores. LOC scores are not significantly correlated with mathematics achievement scores. There are no significant differences in mean LOC scores and category of hearing loss.
A post hoc analysis using additional demographic data demonstrated that for this sample, students from one parent families are significantly more externally oriented than students from two parent families. In addition, students from families describing themselves as low income are significantly more externally oriented than students from self-described medium income families. There are no significant differences in mean LOC scores and place in the family.
CHAPTER V - DISCUSSION

Purpose of the Study

This study explored the relationship between locus of control orientation and Native Indian children with histories of a hearing loss. The relationship between LOC orientation, academic achievement and chronologic age was also explored. Additional data from a larger study, the Carrier-Sekani Project, provided an opportunity to compare LOC orientation with several demographic variables. The population studied is of special interest, they are members of a double minority, being Native Indian and having a history of hearing loss.

Students were given a 30 item LOC measure adapted from the Nowicki-Strickland Scale for Children. The results were then compared to data from the larger study allowing relationships between LOC orientation, hearing status, academic achievement and chronologic age to be explored.

The study offered partial support for the hypothesis that an internal LOC orientation and academic achievement are positively correlated. The results did not support the series of hypotheses holding that an external LOC orientation is positively associated with category of hearing status. The results also supported the hypothesis that an internal LOC orientation is correlated with an increase in chronologic age.

Further, post hoc analyses were possible using demographic data collected by the larger research project. Family income and the number of parents in the home were positively associated with an internal LOC orientation. Place in the family was not significantly related to LOC orientation.
Locus of Control Orientation and Academic Achievement

For this sample an internal LOC orientation correlated positively with reading achievement but not mathematics achievement. The research indicated that generally there is a positive relationship between internal orientation and academic achievement (Gilmor, 1978; Lefcourt, 1976; Nowicki & Roundtree, 1971). The correlation in reading scores matched the expectations established by the literature. Reading ability is a key element in academic success and it seems that it is reflected in these students' general sense of control.

The lack of correlation in mathematics is hard to explain. The disparity may be a peculiarity of the sample in this study. Handy (1993) studied the administration of non-verbal measures of intelligence with this population as part of the Carrier-Sekani Project. Students were divided into three groups, one was otitis prone, the second was normally hearing but received verbal instruction with the administration of intelligence measures and the third, also normally hearing, received pantomime instruction with the intelligence measures. The tests administered were the Wechsler Intelligence Scale for Children, Third Edition and the Stanford Binet, Fourth Edition. She found a significant relationship existed between Performance I.Q. scores and Reading achievement scores for all three groups. There was no significant correlation between Performance I.Q. and math achievement scores for groups 1 and 2, but a significant correlation existed between Wechsler Intelligence Scale performance I.Q. and mathematics achievement scores for the pantomime group.

Handy offered this explanation for the unexpected lack of correlation between I.Q. and math achievement scores. She noted that language and short term memory skills were low for the entire sample when compared to standardized samples. The use of internal language to label visual images and aid recall are skills necessary to complete nonverbal or
visual tasks such as math computation. The over-all effect was to depress math scores generally for this population.

**Locus of Control Orientation and Hearing Status**

There appeared to be no significant differences in LOC orientation between students with histories of a hearing loss and normally hearing children. Students with histories of recurring otitis media or those with mild pure tone losses did not differ significantly from each other or from normally hearing students.

There are several possible explanations for this lack of expected results. The most obvious explanation is that a mild loss is simply not strong enough, in most cases, to affect the social interaction of children to the degree that significant differences appear on LOC measures. Furthermore, the temporary nature of otitis media may allow many children unimpeded social interaction when they recover or as they grow older. Silva, Chalmers and Stewart (1986) in a longitudinal study used the Rutter Child Scale, completed by parents and teachers, to assess differences in behavior problems between group of students with a history of chronic otitis media and a group of normally hearing children. Students were assessed at ages 5, 7, 9 and 11. The authors reported that there was no significant group difference between the combined means for the otitis prone and normally hearing groups. While differences at age 5 were relatively large, these differences narrowed by ages 9 and 11. There are important differences between a behavior scale and an LOC scale. However, the work by Silva, Chalmers and Stewart suggests that otitis prone students do cope with social problems associated with otitis media and that this ability to cope increases with age. The illness may not have a permanent effect on the style in which these students interact with their social environment and therefore does not have a permanent influence on their perception of control over that environment.
The rural and often isolated Native Indian population observed in this study provides a unique cultural context that may also offer an explanation for the limited impact on LOC development by this level of hearing loss. Almost all the participants in the study came from small communities. It is likely that a mild or temporary hearing loss will not cause a sense of loss of control in the familiar, comfortable and well known social environment these children are being reared in. If all the people a child interacts with have the same set of cultural assumptions the need for explicit verbal communication as a means of acting on the social environment may be reduced. More (1987) pointed out, when examining traditional Native Indian learning styles, that non-verbal communication was more important than in contemporary western society. Taking all these considerations together then, these students may not experience a perceived loss of social control because the unique qualities of this culture and lifestyle reduce the impact of impediments to social interaction expected with a mild or temporary hearing loss.

Another possible explanation lies in the generally low language levels of all students participating in the study. Handy discovered that both students with histories of a hearing loss and normally hearing students scored well below the mean for measures of both expressive and receptive language (Handy, 1993). A majority of students came from English as a second language backgrounds. The type of language difficulties associated with otitis media or a mild permanent loss may not create the type of verbal competency disparities often apparent between an otitis prone and a normally hearing group in a majority culture. As receptive and expressive language skills are an important component of interaction in a social environment, this population as a whole may be disadvantaged in that respect for a variety of reasons, a mild or temporary hearing loss being only one.

Another explanation is that there is historical evidence of a prevalence of otitis media in Native Indian Populations (Scaldwell & Fraume, 1985). This may lead to the acceptance of otitis media and its physical and audiologic characteristics as the norm. In
many of the families in this sample, interactive patterns may be in place that accommodate otitis prone children and insure a sense of inclusion and influence thus mitigating against the development of a significantly more external LOC orientation.

The results of this study offered one very important piece of information regarding degree of hearing loss and LOC orientation. We know that populations of Deaf children generally score more externally on LOC measures than hearing populations (Bodner & Johns, 1977; Koelle & Convey, 1982; Miller, 1987; Minter, 1987). What about other people with a hearing loss? We do not know what degree of hearing loss is necessary to be associated with a significantly more external LOC orientation than the normally hearing population. This study begins to explore that bottom threshold. For the children in this population, a mild or temporary hearing loss is not associated with a significantly more external LOC orientation.

**Locus of Control Orientation and Chronologic Age**

As predicted, an internal sense of control positively correlates with chronologic age. This is consistent with the results described in the literature for hearing students (Lefcourt, 1976), for Deaf students (Agrawal & Kuar, 1985) and also for Native Indian students (Tyler & Holsinger, 1975). These results help demonstrate that with this population, the variables normally associated with LOC orientation are present and active here as well.
Locus of Control and Demographic Variables

The results of the analyses on LOC orientation and demographic variables provide some important insights to explain the characteristics of this population. It appears that we can eliminate mild or temporary hearing status variables as being associated with predicted LOC orientation for this population and confirm that some conditions usually associated with LOC orientation in the general population are also present here.

Students from one parent homes in this sample tend to be more externally oriented. The association of LOC orientation and the number of parents in the home does not appear to have been specifically addressed in the literature, however this association may reflect the quality of the parenting environment. Lefcourt (1976) described an internal LOC orientation as being associated with a secure, predictable, nurturing home environment where children are allowed to experience and explore the positive and negative effects of their behavior. It seems logical that two parent families could more easily create this environment than one parent families. On the basis of that assumption it is fair to suggest that for this population an internal LOC orientation may be associated with the secure, appropriately permissive, and predictable environment described by Lefcourt.

Children of parents describing themselves as medium income scored more internally than students coming from self described low income families. This finding is consistent with other research. Shorr & Young (1984) identified socio-economic status as a stronger correlate of LOC orientation than ethnicity Guagnano et al, (1986), specified income as the strongest correlate of LOC orientation in several ethnic minorities including Indian people. This is not a surprising finding. Given the economically depressed conditions on most Native Indian reserves (Jones & Antoine, 1990), it seems likely that people describing themselves as low income are unemployed. Spending money is a major means of influencing one's environment. Lack of money can give one concrete evidence of lack of control.
There was no significant association between LOC and place in the family. Nowicki and Roundtree (1971) found a relationship in the population that they studied. They concluded that externality increases as one moves farther away from the first born position. While the differences in the means for this study were in the same direction as Nowicki and Roundtree's study, they were not significant. The lack of significance may be a product of the unique qualities of this society. The community oriented, extended family network of northern Native Indian society may de-emphasize the importance of place in the nuclear family in the evolution of LOC orientation. Native Indian children from this population may see themselves as part of a larger whole to a greater degree than their non-native counterparts. Therefore, the perception of influence and control over that social environment, normally associated first born children, maybe reduced in this society.

**Summary of Discussion**

As stated previously, this study begins to explore the associations between LOC orientation and the mild or temporary category of the hearing loss spectrum. The most important conclusion is that a mild or temporary hearing loss is not strong enough to be associated with an external LOC orientation for the children in this study. It is possible that the cultural and social characteristics of Carrier-Sekani society mitigates against the development of an external orientation for these children. On the whole though, this population seems to be very like the populations described in the literature. An internal orientation is correlated with age and there is a partial correlation between internal orientation and higher academic achievement. The demographic statistics, family income, place in the family and number of parents in the home, provide some further reinforcement for the suggestion that factors influencing the evolution of LOC orientation in most populations are also predominant in this population.
Validity of the Adapted Locus of Control Measure

As described previously the Nowicki-Strickland Locus of Control Scale was adapted for use with this population. Reliability was demonstrated by the calculation of a Cronbach's alpha of .6009 and a standardized alpha of .6028. Content validity is confirmed by the results of this study. The adapted measure demonstrated that an internal score correlated positively with variables predicted by a review of the literature, age (Agrawal & Kuar; 1985, Lefcourt, 1976; Tyler & Holsinger, 1975) and income (Guagnano et al, 1986; Shorr & Young, 1984). There was partial support for the predicted correlation between LOC orientation and academic achievement (Gilmor, 1978; Lefcourt, 1976; Nowicki & Roundtree, 1971). Taken together these results indicate that the adapted test is a valid measure of LOC orientation and the analyses can be performed and discussed with confidence.

Limitations

1. Instrumentation - Generally it is difficult to choose an appropriate achievement test for this population. The SATHI was chosen because it is the only achievement test that offers norms for hearing impaired and hearing populations, but it has limitations in this situation. Tests designed for urban, American, caucasian children may have a cultural bias that influences the results of data collected on this northern native population. The SATHI can be administered as a group measure. However, Handy (1993) pointed out that many of the children in this study needed to be encouraged to complete the test. The length of time it took many of the students to complete the reading comprehension sub-test caused Handy to question the reliability of the results.
Finding an appropriate LOC measure for this population was also difficult. A LOC measure designed for and normed on a non-Native population may contain a cultural bias that influences the results. Fortunately, in this study, all the students were Native Indian and no comparisons were made using norms based on non-native populations. The Nowicki-Strickland was chosen because it was designed for use with children having reading levels as low as grade 3. As described earlier, it was still necessary to modify this measure by simplifying language and anticipating cultural bias. Reliability coefficients were acceptable but a LOC measure designed more specifically for a population like this and then refined by numerous applications and revisions may have been more reliable and valid.

2. Sample - The ability to generalize may be limited because of the unique qualities of this sample. It is difficult to determine which experiences have the greatest influence on the characteristics of the study sample - cultural experiences or hearing/linguistic experiences. As stated previously, the socio-cultural context in which these Carrier-Sekani children are growing up may act to counter balance the perceived loss of control postulated to be associated with a mild or temporary hearing loss. The Carrier-Sekani people are unique, culturally and experientially, from other native Indian groups across North America. It would be unwise to generalize the results of this study to other native groups.

Another limitation lies in the small degree and range of hearing impairment in those students registering a pure tone loss. Almost all of these students had mild losses and were unaided. A range of loss from mild to profound would have allowed for a correlational analysis to compare degree of externality with degree of hearing loss. As it was, the cases needed to be organized into categories of hearing status rather than a continuum of hearing loss. There were not a sufficient number of students with a moderate loss to constitute a separate category. So while we can say with confidence that a mild loss does not have a significant association with an external LOC orientation in this population, we do not know if a moderate loss is over the threshold of significant association.
3. Demographics - The availability of demographic data offered an important opportunity, but here again some limitations exist. Data on the number of parents in the home offers only a means of developing some logical speculation on parenting style. This is not the same as directly measuring child rearing attitudes or observing parent child interactions. Using income as a measure of socio-economic status, while appropriate with the majority culture, has some limitations studying northern Native society. Factors other than income, such as age or place in the tribal hierarchy may have more influence in determining socio-economic status. Finally, the self report nature of the data collection necessitates the use of caution in interpreting the results. The question on income actually measured perceived income level category not real category.

Implications for Further Research

The greatest value of this study is its contribution to the exploration of the lower threshold of association between hearing loss and LOC orientation. For the population in this study a mild pure tone or a mild temporary hearing loss is not significantly associated with an external LOC orientation. But what about the next category of severity of hearing impairment, students with a moderate loss? This population may well be over the threshold and significantly associated with an external LOC orientation. Even if they are not, the study of students with a moderate loss would still be the next concrete step in describing the relationship between the degree of hearing loss and LOC orientation.

Some studies, Funk and Jones (1986) and Silva et al. (1986), have begun to explore the relationship between parents and otitis prone children, but a lot of work remains to be done. It would be interesting to see if a mild pure tone loss or a mild and temporary loss has an impact on the relationship between parents and their children. Most interaction between parents and children happens in the home, a generally quieter environment than a
Parents often ensure that they have the attention of their children before they deliver communications. Would these conditions or practices override the effects of a mild or temporary hearing loss?

Parents likely do not see an otitis prone child or a child with a mild pure tone loss as handicapped in the way that parents of deaf children are likely to. It would be interesting to determine if parents change their parenting style with these children as is the case with parents of Deaf children. Is the child with a mild loss or the otitis prone child free to experience the positive and negative effects of behavior in the same way that a normally hearing sibling would, or does the child with this level of hearing loss receive the special protection from parents?

This study has indicated that it may be more difficult for a single parent to create the familial conditions associated with an internal LOC orientation. It would be valuable to study more closely the differences between one and two parent families and the LOC orientation of children with histories of a hearing loss.

Further studies of Northern Native Indian populations in the context of the locus of control construct and hearing impairment would be very interesting. The Native Indian child, being raised among brothers, sisters, uncles, aunts, grandparents and cousins is naturally included in an extended family network. In this society there may be very little difference in the sense of inclusion and power to influence the social environment between children with mild or temporary hearing losses and normally hearing children. The social exclusion or limited sense of influence that might have an impact on LOC orientation in other societies may be absent here.

There needs to be a general increase in the study of Northern Native Indian populations as they relate to LOC. These are unique societies. Many of the measures, gages or constructs used to describe majority culture are simply not appropriate here. For example,
such things as age or place in the tribal hierarchy may be stronger correlates of socio-
-economic status than income and may correlate more strongly with LOC as well.

**Practical Applications**

The body of knowledge developed by the study of LOC orientation highlights a dilemma for special educators. How can we provide programs for special needs students that allow them to reach their potential while at the same time avoiding the creation of an overly protective environment that robs them of an internal sense of control? School systems and parents are slowly beginning to realize that otitis media is associated with linguistic, cognitive and behavioral problems. This study has some important information given the stage we are at in our response to otitis media. Carrier-Sekani students with histories of a hearing loss are not significantly more external than their normally hearing peers. As schools develop responses to these students, that appropriately address the associated educational problems, we must be sure that we keep in place approaches that are associated with the development of a normal LOC orientation.
REFERENCES


APPENDIX I – THE MODIFIED NOWICKI-STRICKLAND LOCUS OF CONTROL SCALE OF CHILDREN
We want to know how you think about some things. Here is a list of questions. Read each question carefully to yourself.

Put a circle around the yes or the no. Answer every question.

Only you can tell us what you think. Please be honest.

1. Will most problems solve themselves if you leave them alone? ......................yes no
2. Can you stop yourself from catching a cold? ..............................................yes no
3. Are some kids born lucky? .................................................................yes no
4. Is getting good marks very important to you? .............................................yes no
5. Are you often blamed for things that aren't your fault? .............................yes no
6. If you study hard enough can you pass any subject? .................................yes no
7. Do you feel that most of the time it is not worth it to try hard because things never turn out right anyway? ..................................................yes no
8. If things start out well in the morning is it going to be a good day no matter what you do? .................................................................yes no
9. Can wishing make good things happen? .....................................................yes no
10. Are you usually punished for no good reason at all? ..................................yes no
11. Most of the time is it hard to change a friend's mind? ..............................yes no
12. Does cheering more than luck help a team to win? ..................................yes no
13. Is it easy to change your parents mind about things? ............................yes no
14. Should your parents allow you to make most of your own decisions? ........yes no
15. Do you think that when you do something wrong there's very little you can do to make it right? ..................................................yes no
16. Are most kids born good at sports? .......................................................yes no
17. If you have a problem is it better to forget about it? ..................................yes no
18. Do you have a lot of choice in picking who your friends are? .................. yes no
19. Do you think that Friday the Thirteenth will be an unlucky day for you? ........ yes no
20. Does doing your homework have much to do with the marks you get? ......... yes no
21. If someone your age wants to hit you, is there much you can do to stop it? ...... yes no
22. Do you think that how you act makes people like you or not like you? ........ yes no
23. When people are mean to you is it usually for no reason? ....................... yes no
24. Most of the time, can you change what might happen tomorrow by doing something today? ......................................................... yes no
25. Do you believe that when bad things are going to happen they are going to happen no matter what you try to do to stop them? .......................................................... yes no
26. Can kids get their own way if they keep trying? ..................................... yes no
27. Do good things usually happen because of hard work? .......................... yes no
28. When somebody your age wants to be your enemy is there much you can do to change things? ......................................................... yes no
29. Is it easy to get friends to do what you want them to? .............................. yes no
30. When someone doesn't like you is there much you can do about it? .............. yes no
31. Do you usually think that it's almost useless to try in school because most other students are smarter than you are? ........................................ yes no
32. Does planning ahead make things turn out better? ................................ yes no
33. Most of the time do you have a lot to say about what your family decides to do? ................................................................. yes no
34. Is it better to be smart than to be lucky? ............................................... yes no

66
APPENDIX II – THE NOWICKI-STRICKLAND LOCUS OF CONTROL SCALE FOR CHILDREN
The Nowicki-Strickland Locus of Control Scale for Children

1. Do you believe that most problems will solve themselves if you just don't fool with them?
2. Do you believe that you can stop yourself from catching a cold?
3. Are some kids just born lucky?
4. Most of the time do you feel that getting good grades means a great deal to you?
5. Are you often blamed for things that just aren't your fault?
6. Do you believe that if somebody studies hard enough he or she can pass any subject?
7. Do you feel that most of the time it doesn't pay to try hard because things never turn out right anyway?
8. Do you feel that if things start out well in the morning that it's going to be a good day no matter what you do?
9. Do you feel that most of the time parents listen to what their children have to say?
10. Do you believe that wishing can make good things happen?
11. When you get punished does it usually seem it's for no good reason at all?
12. Most of the time do you find it is hard to change a friend's (mind) opinion?
13. Do you think that cheering more than luck helps a team to win?
14. Do you feel that it's nearly impossible to change your parent's mind about anything?
15. Do you believe that your parents should allow you to make most of your own decisions?
16. Do you feel that when you do something wrong there's very little you can do to make it right?
17. Do you believe that most kids are just born good at sports?
18. Are most other kids your age stronger than you are?
19. Do you feel that one of the best ways to handle most problems is just not to think about them?
20. Do you feel that you have a lot of choice in deciding who your friends are?
21. If you find a four leaf clover do you believe that it might bring you good luck?

22. Do you often feel that whether you do your homework has much to do with what kind of grades you get?

23. Do you feel that when a kid your age decides to hit you, there's little you can do to stop him or her?

24. Have you ever had a good luck charm?

25. Do you believe that whether or not people like you depends on how you act?

26. Will your parents usually help you if you ask them to?

27. Have you felt that when people were mean to you it was usually for no reason at all?

28. Most of the time, do you feel that you can change what might happen tomorrow by what you do today?

29. Do you believe that when bad things are going to happen they just are going to happen no matter what you try to do to stop them?

30. Do you think that kids can get their own way if they just keep trying?

31. Most of the time do you find it useless to try to get your own way at home?

32. Do you feel that when good things happen they happen because of hard work?

33. Do you feel that when somebody your age wants to be your enemy there's little you can do to change matters?

34. Do you feel that it's easy to get friends to do what you want them to?

35. Do you usually feel that you have little to say about what you get to eat at home?

36. Do you feel that when someone doesn't like you there's little you can do about it?

37. Do you usually feel that it's almost useless to try in school because most other children are just plain smarter than you are?

38. Are you the kind of person who believes that planning ahead makes things turn out better?

39. Most of the time, do you feel that you have little to say about what your family decides to do?

40. Do you think it's better to be smart than to be lucky?
APPENDIX III – SCATTERPLOT FOR LOC ORIENTATION AND MATH ACHIEVEMENT
Scatterplot for LOC Orientation and Math Achievement