AN INVESTIGATION OF LOCUS OF CONTROL IN DENE AND NON-DENE STUDENTS

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ABSTRACT

The purpose of this investigation was to explore the dimension of locus of control as it relates to age, grade, sex and ethnicity (Dene, non-Dene). The instrument used was the Nowicki-Strickland Scale of Internal-External Locus of Control (1973).

Subjects were 370 grade three to nine Dene and non-Dene students from a small Northern Canadian community. Along with other school-administered tests, all subjects were given the Nowicki-Strickland Locus of Control Scale for Children in June of 1982.

The data were analyzed using analyses of variance and Scheffé tests. Hierarchical and stepwise regression analyses were used to predict locus of control scores from age, sex, grade and ethnicity. As well, hierarchical and stepwise regression analyses were used to predict achievement scores from age, sex, locus of control and ethnicity.

It was found that both Dene and non-Dene students move from external to internal locus of control over age and grade; however, the Dene group's scores were significantly more external over both age and grade than the non-Dene group's scores. Thus age, grade and ethnicity are significant variables in the prediction of locus of control, with age and ethnicity accounting for 20% of the variance. In the case of achievement, the combination of age, ethnicity and grade four plus ethnicity accounted for 53% of the variance.

The results of the present investigation confirm reported findings that internality is developmental over age and grade. The greater

externality of the Dene students underscores the need for teachers to be knowledgeable, aware and sensitive to the needs of the learner so that the appropriate instructional and reinforcement strategies may be employed.

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INTRODUCTION

"When they learn some inner discipline their general school performance will improve," has been an oft heard statement. It has been made by both Dene and non-Dene parents during the course of an interview, by teachers during the process of consultation and by principals when they are reflecting on the general performance of a student at a staff meeting. Although a record of the frequency of this or similar comments has not been kept, it is a remark which seems to be as haunting as Miller's (1956) "The Magical Number Seven Plus or Minus Two." The researcher has pursued the topic of "inner discipline" with educators, parents and consultants. In most cases general opinion seems to translate into "self-control," "inner control," or an "inner desire do do well."

Social psychologists such as Rotter tend to identify inner control in terms of the continuum of internal-external locus of control, that is, in terms of one's perception of the relationship between one's behaviour and the reinforcement or reward which follows. "The role of reinforcement or gratification is universally recognized by students of human nature as a crucial one in the acquisition and performance of skills and knowledge" (Rotter, 1966, p. 1).

The Purpose of the Study

The purpose of this investigation was to explore the relationship

of age, grade, sex and ethnicity (Dene, non-Dene) to the dimension of locus of control as defined by the Nowicki-Strickland Scale of Internal-External Locus of Control (1973). The relationship of locus of control and achievement was also briefly examined.

Assumptions

> Intrinsic to most studies in education which are concerned with the complexities of human behaviour is the need for certain theoretical assumptions in areas where it is difficult to control for extraneous influences. (Green, 1977, p. 5)

The assumptions inherent in this study concern the instrument that was employed, the method of data collection, and the data that were collected.

Assumption 1. The instrument that was employed in this study measured the constructs which it was designed to measure.

Assumption 2. The students' responses to the instrument were complete, accurate and uncontaminated by attempts to give socially-desirable responses.

Assumption 3. The researcher's reading of the question was the same for all students and was not a significant factor in the students' responses.

Assumption 4. The researcher was not a significant factor in the students' responses.

Limitations

The conclusions reached in this study may not be widely generalizable. The non-Dene students were from varying backgrounds and ethnic origins and the Dene students were members of the Athapaskan linguistic group. The findings could be different for other native linguistic

groups in other geographic locales (Wilson, 1978).

The Nowicki-Strickland Scale has not been normed on Athapaskan children, of whom the Dene are a subgroup; therefore, it may not be an appropriate measure of locus of control for the Dene students. The instrument has, however, been used with the Stoney Indian children of Alberta (Stiemerling, 1980); Indian children from Oklahoma (Martin, 1978); and Chippewa Indians (Tyler & Holsinger, 1975) who live on a reserve in the upper mid-west of the United States.

Given the reported relationship between socio-economic status and locus of control in adults (Battle & Rotter, 1963; Lefcourt, 1966; Seligman, 1975), another possible limitation is the fact that the socio-economic status of the particpants was not taken into consideration in this study.

Statement of the Problem

The organization of the present education system in the Northwest Territories, particularly in the Mackenzie Valley, is such that many Dene children are instructed by non-Dene teachers. This non-Dene teacher, although well-intentioned, may present reinforcement situations which might inhibit a child's (Dene or non-Dene) ability to succeed in school related tasks.

Tha National Indian Brotherhood, in a policy paper, stated,

> The role which teachers play in determining the success or failure of many young Indians is a force to be reckoned with. In most cases the teacher is simply not prepared to understand or cope with cultural differences. Both the child and the teacher are forced into intolerable positions. (N.I.B., 1972, p. 19)

The Indian Act of 1951 controls the life of every Indian person in Canada. For example, the Department of Indian Affairs can form new bands,

can authorize the use of lands for schools and administration buildings, and supervises and makes regulations about the election of Chiefs and councillors.

Jean Chrétien, in the statement of the Government of Canada on Indian Policy, commonly called the "White Paper," stated that "to be an Indian is to lack power - the power to act as owner of your lands, the power to spend your own money and, too often, the power to change your own conditions" (Chrétien, 1969, p. 3).

To further emphasize the condition of "powerlessness" of the Dene people in particular, Phillip Blake at the Berger Inquiry at Fort McPherson made the statement, "Can you believe that we Indian people are now living the way we have chosen to live? Can you really believe that we have chosen to have high rates of alcoholism, murder, suicide and social breakdown?" (Blake, 1975).

According to Rotter (1966), this position of "powerlessness" among the Indian people influences one's locus of control. Knowledge of a student's locus of control can be one piece of information to assist a teacher to provide the appropriate reinforcement strategy and thus enhance that student's learning.

In summary, the problem of locus of control as it applies to the teaching and reinforcement of Dene children can be addressed by examining the relationship of locus of control as it pertains to sex, age, ethnicity and achievement.

Rationale for this Study

The United States Department of Health and Welfare published in 1966 a nation-wide survey entitled Equality of Educational Opportunity

which has since become known colloquially as the Coleman Report (Coleman, J. S.; Campbell, E. Q.; Hobson, C. J.; McPartland, J.; Mood, A. M.; Weinfeld, F. D.; & York, R. T., 1966). This report gives some credence to the introductory remarks. Not only did the Coleman Report examine educational opportunities in schools in terms of racial composition, facilities such as libraries, curricula and teachers, but also in terms of "pupil attitude factor." This factor is defined as "the extent to which an individual feels that he has some control over his own destiny" (Coleman et al., 1966, p. 23). The results of eliciting agreement or disagreement with just three questions such as "Good luck is more important than hard work for success," "Every time I try to get ahead something or somebody stops me," "People like me don't have much of a chance to be successful in life" (p. 654) of a national sample of children in the United States suggested that this pupil attitude factor "appears to have a stronger relationship to achievement than do all the school factors together" (p. 23).

One of the findings of the report was that non-white students with the exception of those who have an Oriental background "have far less conviction that they can affect their own environment and futures" (Coleman et al., 1966, p. 23). It was also noted, however, that those who belong to a minority and believe that they can affect their futures achieve better than those whites who lack conviction. In Rotter's terms, internal minorities achieve better than external whites. An added significant observation by Coleman was that attitudes of internal or external control which are a part of a person's total life experience are dependent on his/her school experience when school achievement is being considered. Coleman's (1966) definition of "pupil attitude"

corresponds to Rotter's definition of internal and external locus of control.

Specifically external locus of control is the idea that a reinforcement is perceived by the subject as the result of luck, chance, fate or powerful others. Internal control is the term applied to a person who perceives that success or failure is contingent upon his own behaviour.

Reviews of external and internal locus of control (Joe, 1971; Lefcourt, 1966; Phares, 1976; Prociuk & Lussier, 1975; Rotter, 1966, 1975; & Throop & MacDonald, 1971) reveal the depth and extent of research in this area. A 1980 computer search yielded over 2700 studies on internal/external locus of control. Of these studies, however, only 7% have related locus of control to school achievement, and only five published studies and one unpublished master's thesis (Stiemerling, 1980) had investigated locus of control in native North Americans. Furthermore, of those six studies, only three (Martin, 1978; Stiemerling, 1980; Tyler & Holsinger, 1975) concerned themselves with native children. There have not been any studies of locus of control in Dene children.

Considering that Brooks (1976) reported that as of 1975 nearly 3000 published studies existed on native North Americans, and considering the importance of the concept of locus of con-rol and achievement as expressed by Coleman (1966), Rotter (1966) and further substantiated by such authors as Crandall and Lacey (1972) and Nowicki (1973), and the paucity of research studies on native North American students, it was clear that the appropriate research strategy in this area was the accumulation of pertinent basic data about Dene children's locus of control.

The Dene and non-Dene students who participated in the study attend

and, for the most part, live in an integrated school and social setting; therefore the second research question was to find out how the two groups compared on the locus of control scales as to age, sex, and grade. In summary, this study directed itself toward empirical questions concerning locus of control beliefs in Dene and non-Dene children with a common school district environment.

Hypotheses

1. For the dependent variable, locus of control, there are no significant effects of (a) grade, (b) sex, (c) ethnicity, (d) the interaction of grade and sex, (e) the interaction of grade and ethnicity, (f) the interaction of sex and ethnicity, and (g) the interaction of grade and sex and ethnicity.

2. For the dependent variable, locus of control, there are no significant effects of (a) age, (b) sex, (c) ethnicity, (d) interaction of age and sex, (e) interaction of age and ethnicity, (f) interaction of sex and ethnicity, and (g) interaction of age and sex and ethnicity.

3. The regression equations predicting the locus of control scores from age, sex, grade and ethnicity will not explain a significant proportion of the total locus of control score.

4. The regression equations predicting the composite CTBS grade equivalent composite score (achievement score) from age sex locus of control will not explain a significant proportion of the total achievement score.

Definition of Terms

For the purpose of this study, locus of control, and Dene and non-

Dene students were defined as follows:

Locus of Control - The degree of internal or external locus of control is the tendency of a person to consider success and failure as being under one's own control or under the control of luck, chance or fate. The present study operationally defined locus of control as the score obtained on the Nowicki-Strickland Locus of Control Scale for Children (1973).

A Dene Student - The word Dene (pronounced den-nay) is an Athapaskan word meaning "The People." The Dene Nation, a political descendant of the Northwest Territories Indian Brotherhood, considers all people of native Athapaskan ancestry to be Dene, whether they be Metis or Indian (Dene Nation, 1982). The Northwest Territories Department of Education requests that those who maintain school registers indicate the ethnicity of the children as being either Indian, Metis, Dene, Inuit[1] or Others.

In March of 1982, the Northwest Territories Special Committee on Education (composed in part of members of the Legislative Assembly) submitted its final report entitled Learning: Tradition and Change in the Northwest Territories (McLaughlin & Curley, co-chairmen, 1982) to the Northwest Territories Legislative Assembly. This document makes reference to only two distinct categories of native peoples - Dene and Inuit.

For this study, a Dene student was operationally defined as a student who called him/herself Indian, Metis or Dene.

A Non-Dene Student - In this study a non-Dene student was one who called himself anything but Indian, Metis, Dene or Inuit. The Northwest Territories Department of Education calls this category, with the exception of the Inuit, Others.

[1]The Inuit students are a group unto themselves and were not part of this study.

Chapter II

REVIEW OF THE LITERATURE

There is a substantial body of literature on both locus of control and native North Americans, but a paucity of information when the two topics are considered simultaneously. In this chapter, a definition of locus of control will be followed by a brief discussion of internal-external locus of control and social learning theory. The arguments in the literature concerning the relationship of sex and age to locus of control will then be reviewed, and cross cultural studies of internal and external locus of control will be examined. The present knowledge about native peoples and locus of control will be summarized. Finally, a brief background of the scales of internal-external locus of control (I-E) will be provided, and a rationale for the use of the Nowicki-Strickland Locus of Control Scale for Children will be stated.

Definition of Internal-External Locus of Control

Those who study human behaviour consider the role of reinforcement as crucial in the attainment of knowledge and the performance of a skill. Rotter (1966) states that locus of control is a personality characteristic based on a person's reinforcement history. He further states that locus of control is of major significance in comprehending how a person learns in different learning situations. The concept of locus of control is defined as follows:

> When a reinforcement is perceived by the subject as following some action of his own but not being entirely contingent upon his action, then, in our culture, it is typically perceived as the result of luck, chance, fate, as under the control of powerful others, or as unpredictable because of the great complexity of forces surrounding him. When the event is interpreted in this way by an individual, we have labelled this a belief in external control. If the person perceives that the event is contingent upon his own behaviour or his own relatively permanent characteristics, we have termed this a belief in internal control. (Rotter, 1966, p. 1)

I-E and Social Learning Theory

Social learning theory may be briefly characterized as an expectancy learning theory based on an empirical law of effect. This law states that "any act which in a given situation produces satisfaction becomes associated with that situation so that when the situation recurs the act is more likely to recur also" (Thorndike, 1904, p. 203). Internal control refers to the tendency to believe that reinforcements are contingent upon some personal attribute, while external control refers to the converse belief that reinforcements are under the control of other forces. It is assumed that a person develops a consistent attitude toward internal or external locus of control as a function of their reinforcement history. This is consistent with Skinner's definition of a positive reinforcer "as any stimulus the presentation of which strengthens the behaviour upon which it is made contingent" (Skinner, 1953, p. 185).

Rotter (1966) argued that "research in human learning should be understood or interpreted in light of the position on a continuum of internal to external control that the task and procedure will be perceived by the subjects." In support of his position, he claimed that,

> The expected relationship between the tendency to perceive what happens to a person as dependent upon his own actions and greater motivation in achievement is generally supported,

> although prediction was not contingent for boys and girls using the Crandall et al. scale with children. (Rotter, 1966, p. 22)

Tombaugh and Tombaugh (1963) suggested that persistence of problem solving behaviour may provide a good index of a subject's motivation level. Battle (1965) took this one step further; she stated that inner directed students were more persistent than outer directed. She also found that I.Q. alone is not sufficient to account for persistence; the more important factor is the child's perception of his capabilities (level of expectancy). It should be noted that the work of Tombaugh and Tombaugh (1963) was with college students while the study of Battle (1965) was with children.

Weiner and Kukla (1970) used the Crandall et al. scale (1965) with children in grades three to six. In grades five and six the scale was administered to the entire class in written form; it was read to small groups of younger students. The results of the study indicated that subjects "high in resultant achievement motivation are more likely to take personal responsibility for success than individuals low in achievement motivation" (Weiner & Kukla, 1970, p. 1). This conclusion seems to confirm the work of Battle (1965) and Coleman et al. (1966).

Thus, it seems that persistence, high achievement, motivation and internal control are related. Schwarz (1966) reviewed Rotter's social learning theory and concluded that generalized expectancy is the sole determiner of the expectancy in a novel situation, that this expectancy depends on the individual's degree of internality or externality, and that with each successive behaviour, the expectancy is based on the results of the previous behaviour. He speculated that expectancy change proceeds more slowly under conditions of spaced experiences than under

massed experiences. It could also be argued that under these conditions extinction might be slower. A study by Kifer (1975), focussing on "the impact patterns of achievement on the personality characteristics of students" (p. 195), lends support to this view. Thus, a student's concept of his own success or failure is cumulative over his years in school.

"Controlability and helplessness play a major role in the child's encounter with our educational system" (Seligman, 1975, p. 153). What is often passed off as retardation may be a result of this same phenomenon. Moreover, failure and the feeling of helplessness are cumulative, and if a child falls behind, and believes his actions will have no effect, then helplessness may set in.

Dweck (1973) demonstrated that learned helplessness can be alleviated. It is not a "success only" approach that proves helpful. What is important is a procedure which teaches the helpless children to take responsibility for failure and attribute it to lack of effort. Thus, to reverse learned helplessness in the classroom, it is necessary for the child to experience some failure and to develop a method of coping with it.

Seligman (1975) suggests that "helplessness" is not limited to the classroom situation; rather it can generalize to or be influenced by life experiences. He argues strongly that poverty can produce "helplessness," and that helping agencies such as social services contribute to this "helplessness state" by providing services for clients and ultimately taking away their feeling of control. Seligman would argue that, in order for those who are both poor and helpless, to benefit from change they need to experience that change as a product of their own actions. In this way, they would experience a feeling of individual mastery, dignity and self-

esteem.

This researcher would strongly suggest that the native people are in this process of asserting themselves, because there is an expectancy "that their own actions might succeed" (Seligman, 1975, p. 165). In 1973, the Dene of the Northwest Territories had by their own efforts successfully filed a caveat on 450,000 square miles of land (the decision was reversed by an Appeal Court), and have successfully influenced the Berger Inquiry of 1975 to recommend that a pipeline not be built in the Mackenzie Valley at this time.

Social learning theory gives us the framework from which to view internal and external locus of control. It not only provides an explanation for the effects of internality and externality but also suggests a tentative technique for the alleviation of the extreme of externality, "learned helplessness."

In summary, Seligman would suggest that if a child from a society which is in a powerless position experiences lack of success in the school situation, he/she would become more external and eventually lapse into a state of helplessness. It is this kind of reasoning that suggests a positive relationship between internality and achievement.

Sex and Locus of Control

Rotter (1966) stated that sex differences in locus of control appear to be minimal. Feather (1967), however, reported that females obtained significantly higher external scores than males at the University of New England. Since then a number of studies, intra-cultural, cross-national and cross-cultural, have corroborated the finding that females are more external than males on locus of control measures.

In 1972, James (1973a) restandardized the James I-E Locus of Control Scale "using both American and Canadian norm groups" (p. 4). He reported that:

> In our 1958 data, there were no significant sex differences for Americans, but there was a significant sex difference for Canadians with Canadian females being more external than Canadian males. In 1972 there were significant sex differences in both countries, but both were in the reverse direction. Males are now more external than females in the U.S.A. and Canada as well. Whether this is due to the impact of "Women's Liberation" or other factors, of course, is not clear from our data. One can only speculate. (James, 1973a, p. 5)

Joe (1971) disagreed with Rotter (1966) and claimed that sex is related to locus of control beliefs. When he directed his attention to children, he concluded that the Crandall et al. scale (1965) was not consistent for males and females.

Gruen, Korte and Baum (1974) developed a group measure of locus of control for use with grade two children. They found that black female children scored more internally than males. Newhouse (1974) found that females who were in grade school accepted more blame for their actions. This is consistent with Crandall et al. (1965) who observed that grade six girls assumed more responsibility for negative events than do boys. Gruen and Ottinger (1969), who used the Cromwell locus of evaluation control scale, did not report any sex differences. Penk (1969), who used Bailer's (1961) scale, also did not report any sex differences with children. Mirels (1970), who used Rotter's (1966) scale with college students, found no significant sex differences in loadings on two factors. Eisenman and Platt (1968), also using Rotter's scale, reported that males were more external. McGhee and Crandall (1968) reported that boys' performance scores were related to their beliefs in failure.

The evidence from various studies relating sex and locus of control in children has been inconclusive. The present study was desinged to examine sex and locus of control in relation to age, grade, and achievement levels in order to understand the functioning of this variable in a particular population of Dene and non-Dene students.

Age and Locus of Control

Lao (1976) reviewed the limited research on the relationship of age and locus of control, and reported that people become more internal from childhood to their early thirties. James (1973b) and Rotter et al. (1972) have contended that the population in general is becoming more external. Thus, Lao's (1974) finding that sons are more external than their parents is not surprising.

Gruen, Korte and Baum (1974) reported that with black children internality was developmental. Boor (1974) concluded, in a study of college students, that internality as defined by Rotter's (1966) I-E Scale was related to age. Rotter (1966) suggested that geographical differences may account for differences in I-E. Shriberg (1974) used the Nowicki-Strickland Scale and stated that "the geographic differences between samples may initially suggest an interpretation that mid-western children are more internally orientated than other children" (p. 868). Eisenman and Platt (1968) also suggested that there could be regional differences in I-E.

Age was included as a variable in the present study in order to determine if the age of a student is related to their locus of control score on the Nowicki-Strickland Scale. This variable was studied in order

to hold geographical location as a constant.

Cross-Cultural Studies of Locus of Control

Using the Rotter Scale, Parsons and Schneider (1974) studied the locus of control of male and female students in eight countries. Oriental societies were represented by India and Japan; Western societies were represented by the United States, Canada, France, Italy, and Germany; and the Middle East by Israel. It was found that overall females were significantly more external. Japanese students had significantly higher external scores overall than the others, while East Indian students were significantly more internal overall than students from other countries. Parsons and Schneider did not find a pattern of scores among countries. However, the European countries had the smallest differences among them. One proposed explanation is that the closeness of the scores between European countries could be expected because the study is "cross-national" as distinct from the comparisons with Japan and Indian which were "cross-cultural." It may be that the difference in cultural norms consitutes the reason for the differences in scores. An alternative explanation could be that the scale does not have the same meaning in other cultures.

McGinnies, Nordholm, Ward and Bhanthumnavin (1974) studied sex and cultural differences in perceived locus of control among students in five countries: Australia, New Zealand, Sweden, Japan and the United States. Overall, they found that female students were significantly more external than male students, thus confirming the Parsons and Schneider (1974) findings. The Swedish and Japanese samples, in that order, were significantly more external than the other three countries. Moreover, the Australian, New Zealand, and United States subjects did not differ

significantly from each other.

The Swedish sample was composed of high school students, while the balance were college students. Perhaps high external scores are typical of the high school age, or perhaps the cause lies in the fact that "Swedish society provides a high degree of security for the individual throughout his lifetime" (McGinnes et al., 1974, p. 454). Parsons, Schneider and Hansen (1970), in their cross-national study of Danish and American undergraduate college students, found that the Danish males scored significantly higher on externality than did the American males; no difference was noted in the females. However, it should be noted that female subjects' scores were significantly more external than male subjects' scores in both groups. Perhaps this degree of externality is typical of the Nordic group. The Japanese sample could again be considered as cross-cultural. McGinnies et al. (1974) suggested that the Japanese sample may be more external because of a cultural background which values politeness, obedience, and conformity. On the other hand, the comparisons between Australia, New Zealand and the United States could be considered cross-national. These three countries have a common cultural heritage and a common belief in the Protestant ethic - that is, hard work and individual initiative, a cluster of values that appear to be logically correlated with high internality.

A study by Hsieh, Shybut and Lotsof (1969) provided support for the effect of culture on internal and external locus of control. In a comparison of Anglo-American, American-born Chinese (one parent born in China) and Chinese (Hong Kong) high school students on Rotter's I-E scale, the Chinese students were significantly more external ($p < .001$) than the other two groups. The American-born Chinese were also significantly more

external ($p < .01$) than the Anglo-American students. Hsieh et al. (1969) stated that the above would support the ideas of Hsu (1963) who, according to Hsieh, postulated that the "individual centered" American personality has been "associated with a culture that has emphasized the qualities of uniqueness, independence and self-reliance of each individual" (p. 122). Whereas the "situation centered" Chinese personality emphasizes kinship and the status quo. Thus the individual in the Chinese culture tends to view his life as being relatively fixed.

Hsieh et al. (1969) in his concluding remarks stated that:

> It appears that a cultural orientation may be closely linked with a personal belief in Internal versus External control. Individuals raised in a culture that value self-reliant individualism, pragmatic ingenuity, and personal output of energy are likely to be more internally oriented that individuals from a culture that tends to emphasize a different set of values. (p. 124)

The above studies indicate that Oriental peoples are more external than Anglo-Americans, and that females are more external than males across cultures and nationalities. However, Lao, Chuang and Yang (1977) challenged the results of Hsieh et al. (1969) because "the Hong Kong Chinese should not be considered as typical Chinese since Hong Kong has been a British colony for a long time, and many of the values, social norms, and expectations are a blend of both Chinese and British traditions" (Lao et al., 1977, p. 301). In its place they chose modernized Taiwan as the site of their research because of observed changes in the social structure and values from a traditional emphasis on the group to an apparent belief in individual control over one's life. They hypothesized that this shift in perception would be greater for males than females, and that an I-E scale could be a useful predictor of behaviour among the Chinese in Taiwan.

Using Levenson's "Internal, Powerful Others and Chance Scales" (IPC) rather than Rotter's I-E scale, they found that "males felt more internal control in general" (Lao et al., 1977, p. 307), and concluded that perhaps "the concept of internal-external control may be one psychological construct which is meaningful across cultures, . . . that it may be tapping some basic element of 'human' nature regardless of culture" (Lao et al., 1977, p. 311).

James (1973), using his own scale, compared the I-E scores of Canadian and American university students. This type of study following the definitions of Price-Williams (1969) would be "intra-cultural" rather than "cross-cultural." He reported that "there were no significant differences between Americans and Canadians across sexes in the I-E variable" (James, 1973, p. 4).

Murray and Mednick (1975) briefly reviewed the literature on locus of control in black men and women. They concluded that blacks score in a more external direction than whites, and that black men are more external than black women. In their own study of attributed achievement outcomes, Murray and Mednick found that low and high achievement black men attributed achievement outcomes to luck, while the high achievement black women attributed their success to effort, ability and a little bit of luck. By way of contrast, low achievement black women attributed their successes, failures to the ease and difficulty of the task respectively. Thus, on the basis of the James (1973) study, it can be concluded that females are not universally characterized by externality.

In a discussion of problems and misconceptions related to internal and external control, Rotter (1975) argued that the current interest in locus of control and social problems is probably related to a "feeling of

powerlessness that seems to permeate all levels of society, at least in Western culture" (p. 56). In his (1966) definition, which he restates in the 1975 article, he noted that "in our culture, it (reinforcement) is perceived as a result of . . ." (p. 57). The culture to which he refers is the American culture which places high value on internality, a value which pervades the literature and seems to subtly suggest that achievement and internality are universals. A specific problem in this area is the finding regarding Oriental people. Their locus of control scores indicate that they are externals, yet their economic and academic achievements are well documented.

Although "the role of reinforcement, reward or gratification is usually recognized by students of human nature as a crucial one in the acquisition and performance of skills and knowledge" (Rotter, 1966, p. 1), one person's perception of and reaction to reward may differ from another's. The critical difference is the degree to which a person perceives the reward as following from his own behaviour, effort or skill, versus the degree to which it is a result of luck, chance, fate or powerful others.

Havighurst (1969) argued that the school should take account of the total strengths and weaknesses of the child and use the best methods available to help that child learn. More specifically, it is up to the teachers to learn about the children, how they live, and the reward and punishment system of the child's particular culture. Because the reward and punishment system is perceived as being different in different cultures, Havighurst proposed a theory of evolution of reward-punishment. He suggested that the earliest needs in human learning are the physiological ones for food and pain avoidance, followed by the approval-

disapproval of other persons. The self-rewarding and self-punishing action of the person's superego would be next, with the highest level involving the rewarding and punishing action of the ego. With respect to educationally relevant implications of this theory, Havighurst noted that in a classroom most upper middle class children are self-rewarders while those of lower socioeconomic status need much external approval.

There are great differences among "Indians" because of the variation of tribal cultures. In general, however, there is a great deal of support provided by an extended family, and praise or blame from the peer group is effective for controlling the behavior of Indian children living in Indian communities. According to Havighurst, some Indian societies that have been studied by Wax (1971) have a within group system of control. In other words, their locus of control is their society rather than the individual him/herself.

The goal of American mass education has been to prepare all persons to function in an average middle class society. It can be argued that, on the whole, the black population of the United States subscribes to this theory. By way of contrast, the American Indian has never truly identified with this dream because of the fundamental differences between his life goals and those of society at large.

> The Indian value system always has been centered on the idea that man should seek to blend his existence into the comparatively passive rhythms of nature as opposed to the dominant society's quest for control of nature through scientific manipulation of its elements. (New, 1970, p. 16)

Gue (1971) agreed with New (1970) and stated that the educational services serve to stream people according to an individualistic oriented culture. Thus, the highest rewards are often given to those who achieve high academic goals for themselves. This is in opposition to the Indian

person whose loyalties are to the group, not to himself as an individual. These cultural differences suggest that the "white" culture would be more internal and the "Indian" culture would be more external in terms of scores on a locus of control scale. Marks and Green (1971) state that because of the present schooling system, many native students become alienated from the larger society. The reasons for this alienation could be that the educational system is committed to integration, a concept that the native person has not accepted (New, 1970), and which, according to Marks and Green (1971), negates the Indian's society, his values, and his traditions. Rotter (1973) suggests that the more alienated a person is, the more external he becomes.

Pelletier (1970) contrasts Western and Indian cultures with respect to child-rearing practices, social control, community consciousness, and power. The central Indian theme is that there is a communal consciousness whose spirit is to serve the group. Participation in this community consciousness is "without premeditation or planning and without verbal communication or signals. It behaves instinctively as if the individuals enjoyed the advantage of some unperceived means of communication" (Pelletier, 1970, p. 4).

Native North American Indians have a wide variety of tribal cultures; therefore, this writer would suggest that it is unwise to make sweeping generalizations about "Indians." However, among most tribes there does seem to be a general valuing of co-operation, mutual support, community consciousness, loyalty to the group, and working in harmony with nature, as opposed to a mastering of nature.

Native Students and Locus of Control

Wilson (1978) provided an overview of native students and of the variables that are related to school achievement. She quoted Johnson (1963) as stating that Indian students express a high need for achievement in a cross-cultural situation. The reason given was that the Indians felt insecure and the whites secure; therefore, the Indians expressed a greater need to achieve. This conclusion seems similar to that of Coleman et al. (1966) who stated that minorities who were in a racially-mixed school did better than those who were not. Specifically, it could be argued that internal native students would perform better in school than their external white peers. Indirect support for this proposition is provided by Havighurst (1957) who found that "Indian groups with the greatest degree of contact with the minority culture[2] did best" (in Wilson, 1978, p. 21).

In contrast to Johnson (1963), Kinsella (1973) argued that native children do not have high expectations. Wilson (1978) stated that there was a need for further study and clarification in the area of the locus of control of native students. She also suggested that individual tribes should be studied separately rather than combining all tribes together.

Clifton (in Wilson, 1978) surveyed the attitudes of junior high school native and non-native students and found that both groups had a positive self-concept although the native students were slightly less positive. He found marked differences in attitudes between grade levels

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[2]The term minority in minority culture in the above article from the context of Wilson's article would mean 'white' or 'majority' culture.

rather than between ethnic groups. In addition, Wilson (1978) suggested that the results of the 1970 National Study of American Indian Research Reports substantiates Clifton's initial findings. She stated that on the basis of a study of 2000 Indian youth in 30 different communities that "Indian youth are about average in self-esteem" (p. 66). Those results were questioned by Wilson (1978) who suggested that extraneous variables such as small numbers in the communities being surveyed could have a bearing on the contradictory results. Clifton (in Wilson, 1978) also noted that many studies of Canadian Indians do not compare with non-Indians and suggested that this was a shortcoming that should be rectified.

The overall conclusion reached by Wilson (1978) was that Indian people seem to have low self-esteem and poorer achievement than white children. This, she felt, was partly due to lack of control Indian children and adults have over their environment. She concluded the review by arguing that more data is needed to understand the nature and effect of cultural variables. It is suggested that locus of control could be one of those variables.

Tyler and Holsinger (1975) studied locus of control differences between rural American Indian and white children who were in the 4th, 7th, 9th and 11th grades using the Nowicki-Strickland Scales. They compared the native students who attended a Chippewa reservation school and the white students who attended a school 30 miles away and found that internality increased with age. Overall Indian students were more external than white students; however, there were no differences on the locus of control measure between the Indian and white students in grade 11. Those researchers speculated that the latter finding may be attributable to the

fact that the Indian externals had dropped out by grade 11. They did not speculate that maybe white externals had also dropped out. They found no support for one of their original hypotheses that Indian girls would be more internal than Indian boys.

Martin (1978) compared self-esteem and locus of control in over 750 native and non-native students randomly selected from over 22 school systems in Oklahoma. He found no significant differences in the development level of self-esteem until the students reached junior high school. "At that level the Indian children are significantly lower than white children in self-esteem and this difference persists throughout the high school grade levels" (Martin, 1978, p. 27). The tentative explanation was that this difference could be a result of how the Indian students are reacting to adolescence.

In terms of locus of control, Martin (1978) and Tyler and Holsinger (1975) agree that both native and non-native children become more internal with age. Non-native children tend to be more internal, with grade 12 a notable exception. Tyler and Holsinger (1975) found no difference at the grade 11 level and Martin (1978) concluded that at the grade 12 level there was no significant difference in locus of control between native and non-native males.

On the other hand, Mackey (1979) compared non-native and native college students on the basis of locus of control and concluded that the native population was significantly more internal. Harris (1979) reported that in his research native college students from the southwest United States were more internal than all others, and accounted for this finding in terms of the motivation to achieve. Thus, he also strongly recommended that locus of control be studied by geocultural area.

Given the equivocal nature of the research evidence, the present study was designed to compare native and non-native students who reside in the same geocultural area with respect to locus of control.

Scales of Internal-External Control

The first test of internal-external control was developed by Phares (1955). It is a 13-item Likert-type scale. James (1957) developed a more lengthy revision of the (1956) Phares scale. It is known as the "James-Phares Scale." This is a 60-item Likert scale containing 30 items designed to measure internal versus external locus of control and 30 filler items. It was revised in 1962 and 10 years later in 1972. The James I-E Scale in 1972 used both Canadian and American norms as it had done in previous years.

Rotter (1966) developed a forced-choice form of the I-E scale which "controls for response set and social desirability more stringently" (James, 1973, p. 13). "The correlation of the James and Rotter I-E scale is .70" (James & Shepel, 1978). Throop and MacDonald (1971) indicated that Rotter's (1966) scale is presently considered the best test for use with an adult population. Jessor, Graves, Hanson and Jessor (1968) developed a short version of Rotter's (1966) I-E scale for adults. The above-mentioned scales have been developed for college students and other adults.

Gruen, Korte and Baum (1974), Mischel, Zeiss and Zeiss (1974) and Nowicki and Duke (1974) have each developed an internal-external locus of control scale to be used with pre-school or children who are eight years of age and younger. Bailer (1961), Battle and Rotter (1963), Crandall, Katkovsky and Crandall (1965) and Nowicki and Strickland (1973) each

developed an I-E scale to be used with older children. Graves (1971) adapted Rotter's I-E scale for high school students and Rhiengelheim, Bailer and Morrissey (1969) modified Crandall et al.'s scale (1965) for use with mentally retarded children.

In summary, I-E scales have been developed for individuals of different ages and abilities. However, I-E scales have not been developed to measure I-E locus of control in native North Americans.

A Rationale for Nowicki-Strickland Locus of Control Scale for Children

The Crandall et al. scale (IAR) for internal-external locus of control "limits the source of external control to those persons who most often come in face-to-face contact with a child, his parents, teachers and peers" (Crandall et al., 1965, p. 93), whereas the Nowicki-Strickland scale is based on Rotter's definition of locus of control which reflects a belief in the generality of external-internal focus. Stephens (1972) stated that the Nowicki-Strickland Scales not only reflect I-E but also "what could be termed an expectancy of competence" (Stephens, 1972, p. 5). He observed, however, that the IAR (Crandall et al., 1965) scale has another problem. It is that "the child must choose to overtly accept or deny responsibility for his successes or failures. Thus, public choice itself . . . is likely to have been subject to direct reinforcement in the past" (Stephens, 1972, p. 5). Mischel, Zeiss and Zeiss (1974) stated that Crandall's scale "is not suitable for children below the third-grade level and deals only with academic-intellectual situations" (p. 266).

Some students in the sample used in the present study have not achieved a third-grade reading level, which is the minimum requirement

for the Crandall et al. (1965) IAR scale. The same problem could present itself with the Nowicki-Strickland Scale (1973). However, the authors in the initial norming of the test "read each item aloud, asking subjects to check yes or no on the test sheet" (Nowicki-Strickland, 1973, p. 151). Finally, Crandall's IAR scale has a forced choice format with a stem and two possible endings, thereby requiring a level of comprehension higher than grade three.

As noted above, the Nowicki-Strickland Scale (1973) was designed to study the "effects of generalized locus of control orientation of a child's behaviour" (Nowicki-Strickland, 1973, p. 149), and furthermore, the items on the Nowicki-Strickland Scales "describe reinforcement situations across interpersonal and motivational areas such as affiliation, achievement and dependency" (Nowicki-Strickland in Tyler & Holsinger, 1975, p. 151). It has been used in all the reported studies with native children. Stiemerling (1980) who used both the Nowicki-Strickland Scale (1973) and the Crandall et al. IAR Scale (1965) in her study of Stoney Indian children noted that the IAR is restricted to "significant others" whereas the Nowicki-Strickland scale is more general.

Martin (1978) and Tyler and Holsinger (1975) used the Nowicki-Strickland (1973) scale with native children because the scale was based on Rotter's definition of internal-external locus of control. Similarly, Mackey (1979), in her doctoral dissertation, chose Rotter's I-E scale to study locus of control and American Indian college students.

The results of Tyler and Holsinger (1975) and Martin (1978) do serve as a base for further research. Wilson (1978) stressed the point that "more data must be gathered and analyzed in order to understand how cultural variables and academic achievement are related" (p. 22).

In summary, the Nowicki-Strickland Locus of Control Scale for Children (1973) was used in this study not only because it had been used by other researchers, but also because it measured a generalized locus of control which pertains to many facets of a child's life, thereby making it more appropriate than a scale that was specific to achievement.

Chapter III

RESEARCH METHODOLOGY

Subjects

The subjects consisted of three hundred seventy Dene and non-Dene students from grades three to nine in a small Northern Canadian community. There were one hundred eighteen Dene students and two hundred fifty-two non-Dene students in the final sample. One hundred eighty-five were male and one hundred eighty-five were female. Eight Inuit students were dropped from the original sample of four hundred because "Inuit" was considered to be a separate classification from Dene and non-Dene (McLaughlin & Curley, 1982). Twenty-two other students were dropped from the sample because of incomplete data.

A Dene student "means a descendant of the Chipewyan, Slavey, Loucheux, Dogrib, Hare, Cree people or Metis who traditionally used and occuped the areas now known as the Northwest Territories, Yukon and the northern portions of British Columbia, Alberta, Saskatchewan and Manitoba" (Dene Nation Newsletter, Vol. 3, Issue 3, May 1982). Non-Dene students were those who classified themselves as neither Dene, Indian, Metis or Inuit.

Table 1 describes the total sample in terms of mean age, and achievement level by grade according to the May 1982 results of the Canadian Tests of Basic Skills (CTBS). Tables 2 and 3 describe the mean age and achievement scores by grade and sex of the Dene and non-Dene students, respectively.

Table 1

Mean Age, Age Range and Achievement Scores for the Total Group by Grade

Grade	N	Mean Age	Age Range		Mean Achievement Score
			Min	Max	
3	57	9.4	8.1	12.5	3.6
4	55	10.4	9.4	13.1	4.2
5	65	11.6	10.4	14.9	5.4
6	65	12.1	10.8	13.6	6.7
7	60	13.4	10.8	15.3	7.5
8	37	14.2	13.3	16.8	8.5
9	31	15.3	14.3	19.9	10.1

Table 2

Mean Age, Age Range, and Achievement Scores of Dene Students by Grade and Sex

Grade	Sex	N	Mean Age	Age Range		Mean Achievement Score
				Min	Max	
3	M	10	9.4	8.5	12.5	3.0
	F	10	9.6	8.5	12.0	3.5
4	M	8	10.8	9.4	11.9	3.1
	F	13	11.1	9.3	12.6	3.8
5	M	14	12.3	10.4	14.9	4.9
	F	9	12.4	10.6	14.5	5.2
6	M	7	12.6	12.2	13.3	6.2
	F	12	12.0	10.8	13.6	6.3
7	M	8	14.1	12.7	15.3	6.9
	F	11	13.1	12.5	14.2	7.8
8	M	4	14.9	13.5	16.8	7.9
	F	5	14.3	13.8	15.2	7.9
9	M	3	14.9	14.5	15.2	11.4
	F	4	14.8	14.3	15.2	10.9

Table 3

Mean Age, Age Range and Achievement Scores of Non-Dene Students by Grade and Sex

Grade	Sex		Mean Age	Age Range		Mean Achievement Score
				Min	Max	
3	M	15	9.2	8.1	10.4	3.8
	F	22	9.3	8.4	11.4	3.8
4	M	12	10.0	9.4	10.8	4.2
	F	22	10.1	9.4	12.1	4.8
5	M	22	11.3	10.5	13.7	5.4
	F	20	11.1	10.5	12.6	5.8
6	M	23	12.1	11.1	13.5	6.9
	F	23	11.9	11.2	13.0	6.8
7	M	28	13.5	12.6	15.0	7.3
	F	13	13.1	10.8	14.0	7.9
8	M	15	14.0	13.3	15.9	8.5
	F	13	14.1	13.5	15.8	8.9
9	M	16	15.3	14.4	18.3	9.5
	F	8	15.7	14.6	19.9	10.5

Instrumentation

Nowicki-Strickland Locus of Control Scale for Children

> The Nowicki-Strickland Locus of Control Scale is a paper and pencil measure consisting of 40 questions that are answered yes or no by placing a cross next to the question. This form was constructed on the basis of Rotter's definition of the internal-external control of reinforcement dimension. The items describe reinforcement situations across interpersonal and motivational areas such as affiliation, achievement and dependency. (Nowicki-Strickland, 1973, p. 149)

Questions such as "Do you believe that most problems will solve themselves if you just don't fool with them?" are asked. The individual's score consists of the total number of items marked in the external direction. Thus, the higher an individual's score, the more external is his locus of control orientation.

The authors of the scale report means and standard deviations of their scale for males and females for grades three to twelve. These were, however, based on a non-native population. However, comparisons were made with Tyler and Holsinger's (1975) data and also with Martin's (1978) data.

Nowicki-Strickland (1973) reported that:

> Estimates of internal consistency via the split-half method, corrected by the Spearman-Brown formula are r = .63 (for Grades 3, 4, 5); r = .68 (for Grades 6, 7, 8); r = .81 (for Grade 12). These reliabilities are satisfactory in light of the fact that the items are not arranged according to difficulty. Since the test is additive and the items are not comparable, the split-half reliabilities tend to underestimate the true internal consistency of the scale.
>
> Test-retest reliabilities sampled at three grade levels, 6 weeks apart, were .63 for the third grade, .66 for the seventh grade, and .71 for the tenth grade.

In addition they state that "locus of control scores were not significantly related to social desirability" (Nowicki-Strickland, 1973,

p. 152). With regard to socioeconomic level, they report that all correlations were negative. However, they suggest that internality for males related significantly to higher occupational levels.

After investigating the construct validity of the Nowicki-Strickland scale, the authors state:

> It was expected that there would be significant but not high correlations between the measures. The relation to the Intellectual Achievement Responsibility scale was examined first. In a sample of black third (N = 182) and seventh graders (N = 171), there were significant correlations with the I+ but not with the I- scores (for the third grade r = .31, $p < .01$; for the seventh grade, r = .51, $p < .01$). Next the correlation with the Bialer-Cromwell score (see Bialer, 1961) was also significant (r = .41, $p < .05$) in a sample of white children (N = 29) aged 9-11. Finally, the relation between the Rotter and the Nowicki-Strickland adult scales was also significant in two studies with college students (N = 76, r = .61, $p < .01$, N = 46, r = .38, $p < .01$). These relations suggest added support for the construct validation of the Nowicki-Strickland scale. (Nowicki-Strickland, 1973, p. 153)

Testing Procedure

Within the context of a battery of school-administered tests, all subjects were given the Nowicki-Strickland Locus of Control Scale for Children in June of 1982. The scale was administered by this writer to all of the students in grades three to nine.

The procedures as outlined in Nowicki and Strickland's original paper were followed. The subjects were told that the examiner was gathering information concerning attitudes and opinions of students at various grade levels to see how they differed depending on the age of the student. They were assured that their individual responses would be kept confidential.

Each item was read aloud twice to each class group. The subjects were to check yes or no on the test sheet. This oral presentation was

used to make the items more understandable and easier to follow.

Analysis of Data

The data were analyzed using analyses of variance and Scheffé tests to describe the results as they pertained to the total group and to the two sub-groups, Dene and non-Dene. Hierarchical and stepwise regression analyses were used to predict locus of control score from age, sex, grade and ethnicity. As well, hierarchical and stepwise regression analyses were used to predict achievement scores from age, sex, locus of control and ethnicity. The computer programs for the analysis of the data were taken from Nie, Hull, Jenkins, Steinbrenner, and Bent (1975).

Levels of significance were generally set at $p < .01$. In specified instances involving the Scheffé tests, however, the less stringent levels of $p < .05$ and $p < .10$ were used.

Chapter IV

RESULTS

This chapter will present the summary statistics for the total group, the Dene group, and the non-Dene group; the results of the analyses of the data, and the interpretation of the results as they pertain to the rejection or acceptance of the hypotheses presented in Chapter I.

Summary Statistics

This section will present a comparison of grade, sex, ethnicity and locus of control scores for the entire group, for the Dene, and for the non-Dene sub groups.

Table 4 presents the means and standard deviations of the Nowicki-Strickland scores for the total group at each grade level. Figure 1 graphically illustrates these data.

Table 4

Means, Standard Deviations of Locus of Control (LOC) Scores by Grade for the Total Group

Grade	N	$\bar{X}$ LOC	S.D.
3	57	18.88	3.85
4	55	18.18	4.39
5	65	16.86	4.22
7	65	15.03	4.61
7	60	13.97	4.08
8	37	12.11	3.96
9	31	11.71	4.73

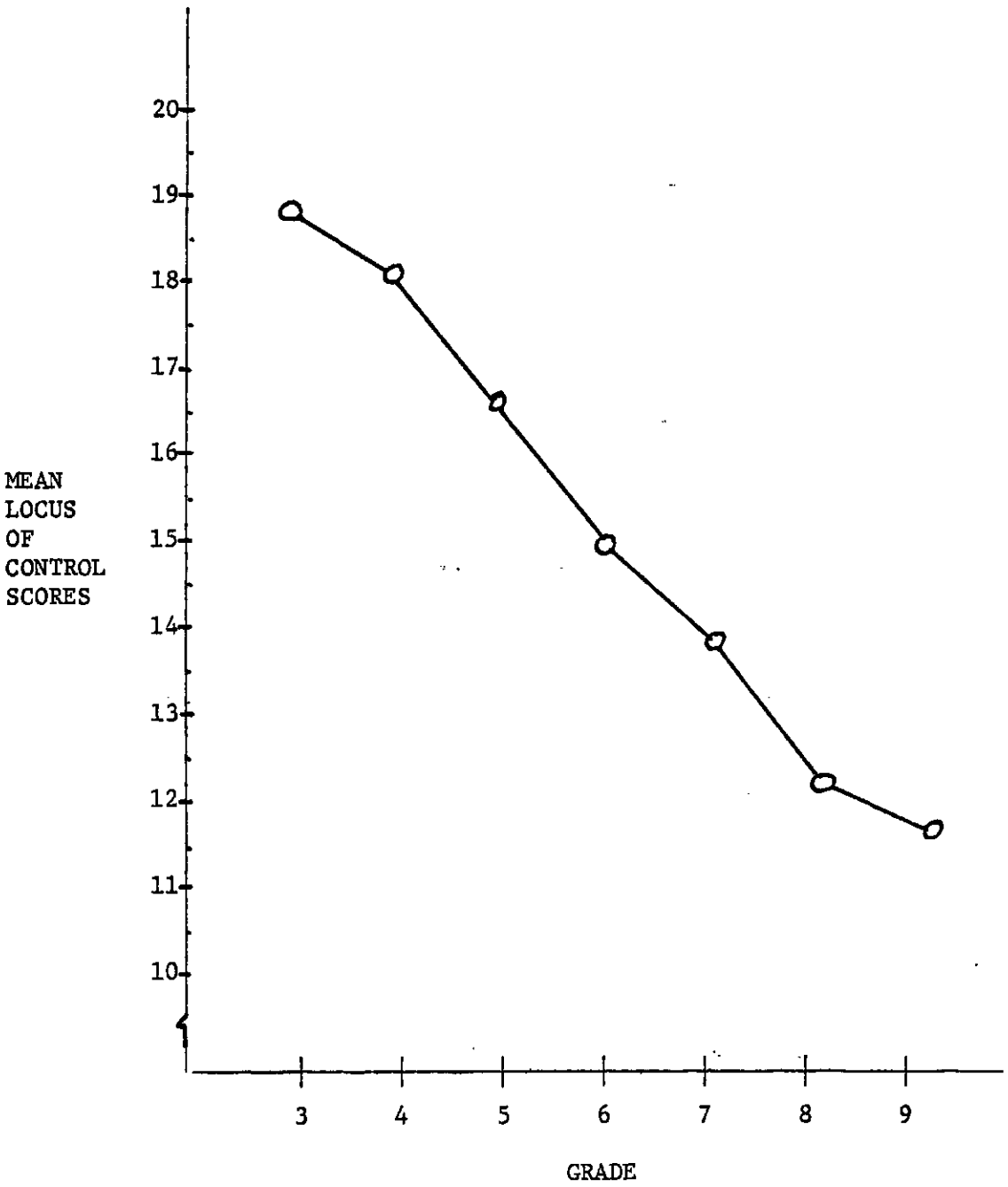

Figure 1. Means of Locus of Control Scores by Grade for All Students

Considering for the moment, grade and locus of control, and disregarding the other variables, the data presented in Table 4 and illustrated in Figure 1 indicate that locus of control and grade are negatively related; that is, the higher the grade the more internal the student.

This is supported by the three way analysis of variance in Table 32 (see page 61).

Multiple comparisons by a Scheffé test were performed to examine differences between means of locus of control scores by grade. Since this procedure is rigorous, a less conservative significance level of $p < .10$ was used (Table 5). The first significant shift in locus of control for the entire group occurs between grades three and six ($p < .01$), when the means of grade three and six are compared.

Table 5

Scheffé Test of Differences Between Grade Group Means of the Total Group for Locus of Control Scores

Grade	Grade						
	3	4	5	6	7	8	9
3		.70	2.02	3.85	4.91*	6.77*	7.17*
4				3.15**	4.21*	6.11*	6.47*
5					2.89**	4.75*	5.15*
6					1.06	2.92***	3.32**
7						1.86	2.26*
8							0.40
9							

*$p < .01$
**$p < .05$
***$p < .10$

Table 6 presents the means and standard deviations of locus of control scores for all the female and male subjects by grade. These results are graphically illustrated in Figure 2. There were no significant differences between the means of the male and female students' locus of control scores at any grade level. The data presented in Table 6 and

illustrated in Figure 2 also indicate that locus of control and grade and sex are negatively related; that is, the higher the grade the more internal the male or female student. This is supported by one way analyses of variance, reported in Table 7 for male students by grade [F (6,167) = 10.926, p < .001], and in Table 8 for female students by grade [F (6,178) = 8.676, p < .001].

Table 6

Means, Standard Deviations of Locus of Control Scores (LOC) by Grade and Sex for the Total Group

	MALE			FEMALE		
Grade	N	$\bar{X}$ LOC SCORE	S.D.	N	$\bar{X}$ LOC SCORE	S.D.
3	25	18.64	4.59	32	19.06	3.23
4	20	17.90	4.11	35	18.34	4.59
5	36	16.97	4.31	29	16.72	4.18
6	30	14.37	4.67	35	15.60	4.54
7	36	13.47	3.60	24	14.71	4.69
8	19	12.32	4.40	18	11.89	3.55
9	19	10.84	4.38	12	13.08	5.12

Table 7

Analysis of Variance of Locus of Control Scores for the Total Male Group by Grade

Source	df	m.s.	F
Grade	6	199.919	10.926*
Error	178	18.298	

*p < .001

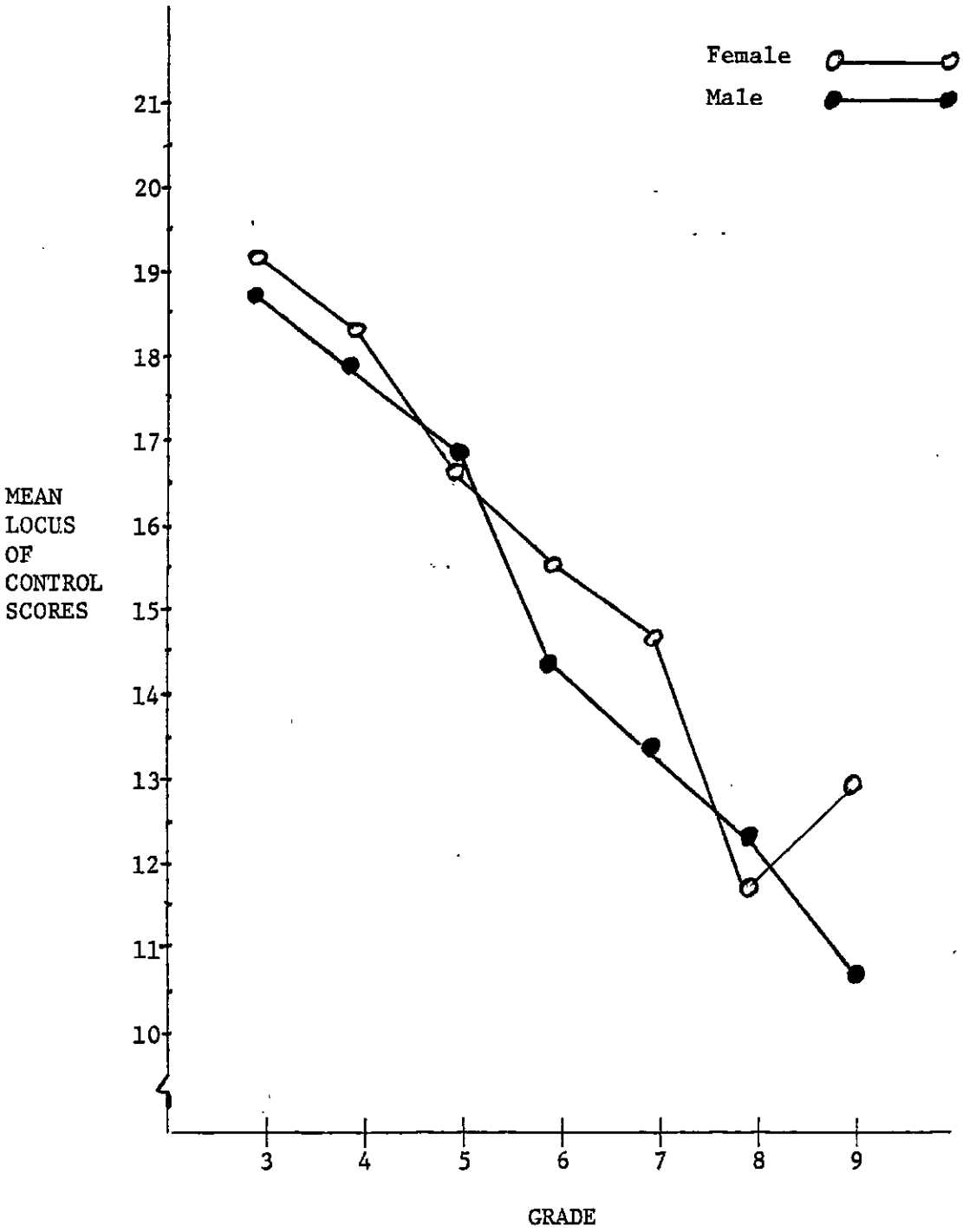

Figure 2. Means of Locus of Control Scores for Male and Female Subjects by Grade for Total Group

Table 8

Analysis of Variance of Locus of Control Scores for the Total Female Group by Grade

Source	df	m.s.	F
Grade	6	157.91	8.676*
Error	178	18.20	

*$p < .001$

Table 9 presents the results of the Scheffé test of differences between male grade group means. The results indicate that there is a significant difference between grade three and six ($p < .05$). Table 10 presents the results of the Scheffé test of differences between female grade group means. The results indicate that there is a significant difference between grade three and six.

Table 11 presents the means and standard deviations of locus of control scores for all of the male and female subjects. If one considers the male and female subjects' locus of control scores in isolation and performs a t test there is a significant difference t ($368 = 2.32$, $p < .02$). However, when one takes into consideration grade, ethnicity and sex over the entire population, and performs a three way analysis of variance (Table 31), the relationship between sex and locus of control is no longer significant.

Table 9

Scheffé Test of Differences Between Male Grade Group Means for Locus of Control Scores

Grade	Grade						
	3	4	5	6	7	8	9
3		0.74	1.67	4.27**	5.17*	6.32*	7.80*
4			0.93	3.53	4.43**	5.58**	7.06*
5				2.60	3.50***	4.65**	6.13*
6					0.90	2.05	3.53
7						1.15	2.63
8							1.48
9							

*p < .01
**p < .05
***p < .10

Table 10

Scheffé Test of Differences Between Female Grade Group Means for Locus of Control Scores

Grade	Grade						
	3	4	5	6	7	8	9
3		0.72	2.34	3.46***	4.35**	7.17*	5.98**
4			1.60	2.74	3.63	6.45*	5.25**
5				1.12	2.01	4.83**	3.64
6					0.89	3.71	2.52
7						2.82	1.63
8							1.19
9							

*p < .01
**p < .05
***p < .10

Table 11

Means and Standard Deviations of Locus of Control Scores for All the Male and Female Subjects

	N	$\bar{X}$ LOC SCORE	S.D.
Male	185	15.09	4.92
Female	185	16.25	4.77

A third way to examine the data for the entire population is by ethnicity and locus of control. Table 12 presents the means and standard deviations of the locus of control scores for the Dene and non-Dene subjects.

Table 12

Means and Standard Deviations of Locus of Control Scores (LOC) for All the Dene and Non-Dene Subjects

	N	$\bar{X}$ LOC SCORE	S.D.
Dene	118	17.19	4.70
Non-Dene	252	14.96	4.80

A three way analysis of variance confirms that ethnicity was a significant variable F (1, 342) = 13.348, $p < .001$ (Table 32); however, the interactions of grade and ethnicity, sex and ethnicity were not significant.

Dene Group

The Dene and non-Dene groups were parsed out and examined individually.

The means and standard deviations by grade of the Dene group are presented in Table 13, by sex in Table 16, and by grade and sex in Table 17. Figures 3 and 4 provide a graphic portrayal of Tables 13 and 16, respectively.

The means of the locus of control scores for the Dene population shift from external to internal over grade. This can be observed in Figure 3. A one-way analysis of variance (Table 14) indicates that grade is a significant factor in this change F (6, 111) = 9.374, p < .001.

Multiple comparisons by a Scheffé test were performed to examine differences between means of locus of control scores of Dene students by grade. Since this procedure is rigorous, a less conservative significance level of p < .05 was used (Table 15).

One significant shift from external to an internal direction (p < .05) occurs at grade six when the means of grade three and six are compared.

Table 13

Means and Standard Deviations of the Locus of Control Scores for the Dene Population by Grade

Grade	N	$\bar{X}$ LOC	S.D.
3	20	20.45	3.90
4	21	20.10	3.29
5	23	18.17	4.12
6	19	15.16	5.21
7	19	14.90	2.83
8	9	12.56	3.68
9	7	13.71	3.99

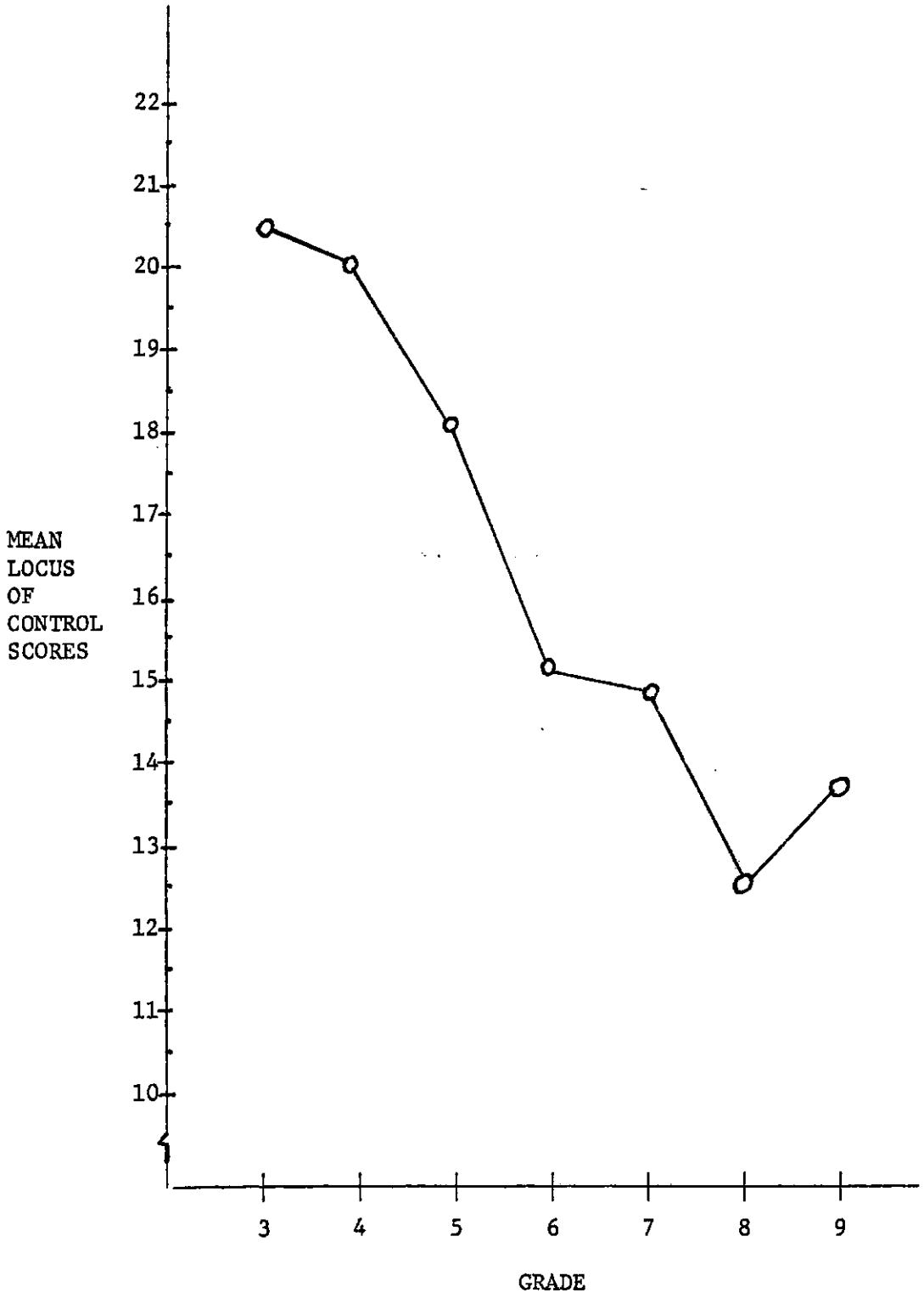

Figure 3. Means of Locus of Control Scores by Grade for Dene Students

Table 14

Analysis of Variance of Locus of Control Scores for the Dene Group by Grade

Source	df	m.s.	F
Grade	6	144.748	9.374*
Error	111		

*$p < .001$

Table 15

Scheffé Test of Differences Between Dene Grade Group Means for Locus of Control Scores

Grade	Grade						
	3	4	5	6	7	8	9
3		0.35	2.28	5.29**	5.50*	7.99*	6.74**
4			1.93	4.94**	5.20**	7.54*	6.39**
5				3.01	3.27	5.61**	4.46
6					0.26	2.60	1.45
7						2.34	1.19
8							1.15
9							

*$p < .01$
**$p < .05$

Table 16 presents the means and standard deviations of the locus of control scores for the Dene female and Dene male students. A two tailed t test of the means of the Dene female and male students was not significant, t (116) = 0.799 (p n.s.).

Table 16

Means and Standard Deviations of the Locus of Control Scores for the Dene Group by Sex

	N	$\overline{X}$ LOC SCORES	S.D.
Female	64	17.30	4.68
Male	54	17.07	4.76

Table 17 presents the means and standard deviations of the Locus of Control scores for the Dene population by sex and grade. This information is graphically illustrated in Figure 4. Both Table 17 and Figure 4 indicate that there is a growth in internality over grade for both female and male Dene students. The one-way analysis of variance for male Dene students (Table 18) and for female Dene students (Table 19), as well as the lack of interaction effects of Grade by Sex in three-way analysis of variance reported in Table 32 support the finding of growth of internality.

Multiple Scheffé comparisons were performed to examine differences between locus of control scores of male Dene students and female Dene students by grade. The results are given in Table 20 and Table 21, respectively.

The first and only significant difference in means for the Dene male group was between grades three and eight ($p < .05$). For the Dene female population the first significant difference in means was between grades four and six ($p < .10$). A more significant shift occurred between grades four and seven ($p < .05$).

Within groups there is no significant difference between locus of

of control scores by sex between grades except at the grade four level. Grade four Dene male students are more internal t (19) = 1.85, $p < .080$ than their female counterparts.

Table 17

Means and Standard Deviations of the Locus of Control Scores for the Dene Group by Sex and Grade

Grade	MALE			FEMALE		
	N	$\bar{X}$ LOC SCORE	S.D.	N	$\bar{X}$ LOC SCORE	S.D.
3	10	20.80	4.37	10	20.10	3.57
4	8	18.50	3.12	13	21.08	3.10
5	14	18.43	4.00	9	17.78	4.52
6	7	14.43	4.89	12	15.58	5.55
7	8	14.75	2.82	11	15.00	2.97
8	4	11.25	4.99	5	13.60	2.30
9	3	14.67	5.13	4	13.00	3.56

Table 18

A One-Way Analysis of Variance for the Locus of Control Scores for Male Dene Students and Grade

Source	DF	MS	F
Grade	6	71.007	4.315*
Error	47	16.461	

*$p < .002$

Table 19

A One-Way Analysis of Variance for the Locus of Control Scores for Female Dene Students and Grade

Source	df	MS	F
Grade	6	83.644	5.421*
Error	57	15.430	

$p < .001$

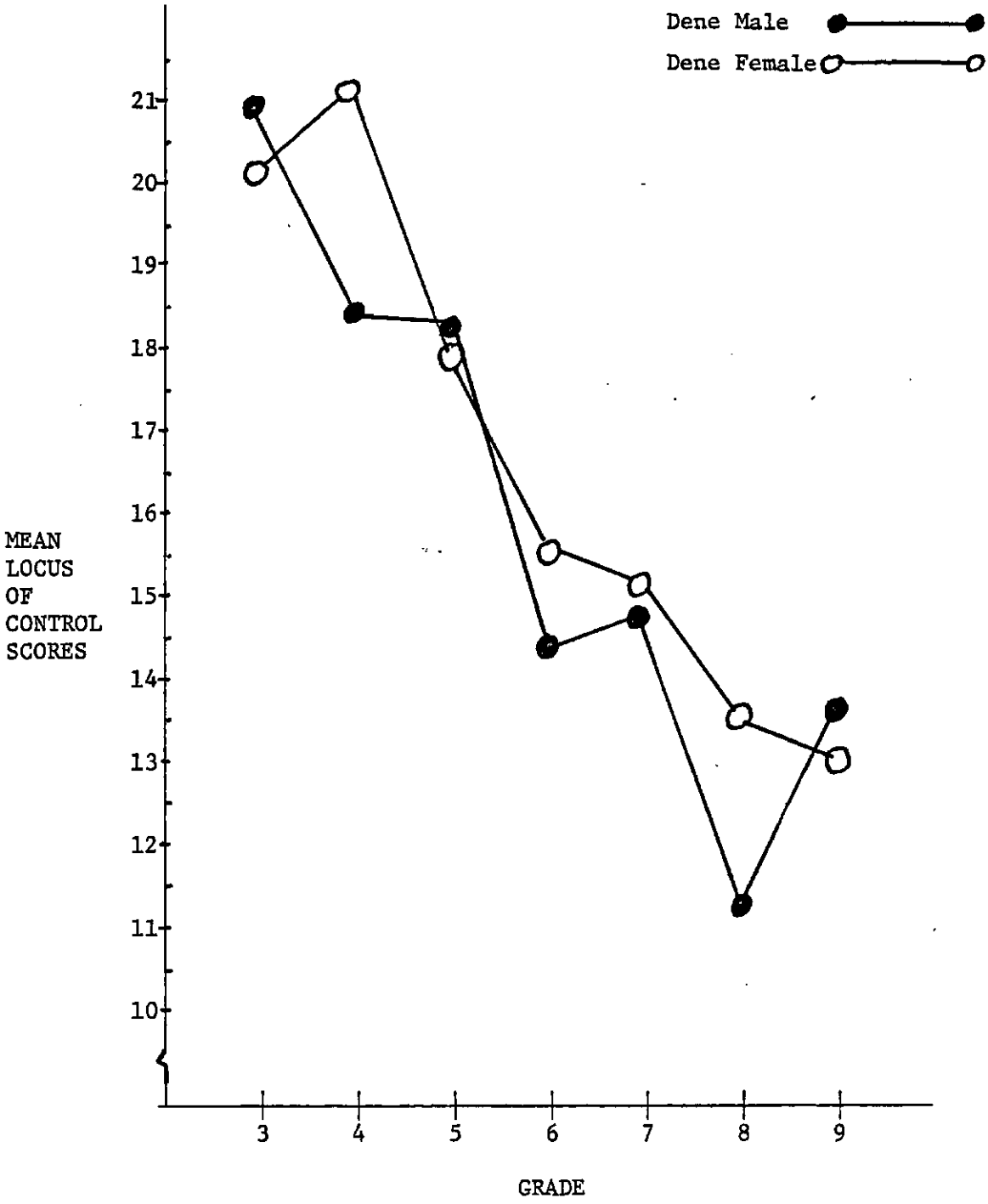

Figure 4. Mean Locus of Control Scores by Grade of the Dene Male and Dene Female Students

Table 20

Scheffé Test of Differences Between Dene Male Group Means for Locus of Control Scores

Grade	Grade						
	3	4	5	6	7	8	9
3		2.30	2.37	6.37	6.05	9.55**	6.13
4			0.07	4.07	3.75	7.25	3.83
5				4.00	3.68	7.18	3.76
6					0.32	3.18	0.24
7						3.50	0.08
8							3.42
9							

**p < .05

Table 21

Scheffé Test of Differences Between Dene Female Group Means for Locus of Control Scores

Grade	Grade						
	3	4	5	6	7	8	9
3		0.98	2.32	4.52	5.1	6.5	7.1
4			3.3	5.5***	6.08**	7.48***	8.08***
5				2.20	2.78	4.18	4.78
6					0.58	1.98	2.58
7						1.40	2.00
8							0.60
9							

**p < .05
***p < .10

Non-Dene Group

The data for the non-Dene population was examined by total group, grade, sex and grade and sex.

Table 22 and Figure 5 indicate that the locus of control scores move in an internal direction with grade increase. This is confirmed for the total sample by a three-way analysis of variance for overall grade effects (Table 32) and particularly for this subgroup by the results of a one-way analysis of variance (Table 23) [F (6,245) = 11.092, $p < .001$].

Table 22

Means and Standard Deviations of the Locus of Control Scores for the Non-Dene Population by Grade

Grade	N	$\overline{X}$ LOC SCORE	S.D.
3	37	18.03	3.60
4	34	17.00	4.61
5	42	16.14	4.15
6	46	14.99	4.40
7	41	13.54	4.51
8	28	11.96	4.10
9	24	11.13	4.84

Table 23

One-Way Analysis of Variance of Locus of Control Scores for the Non-Dene Group by Grade

Source	df	m.s.	F
Grade	6	205.940	11.092*
Error	245	18.567	

*$p < .001$

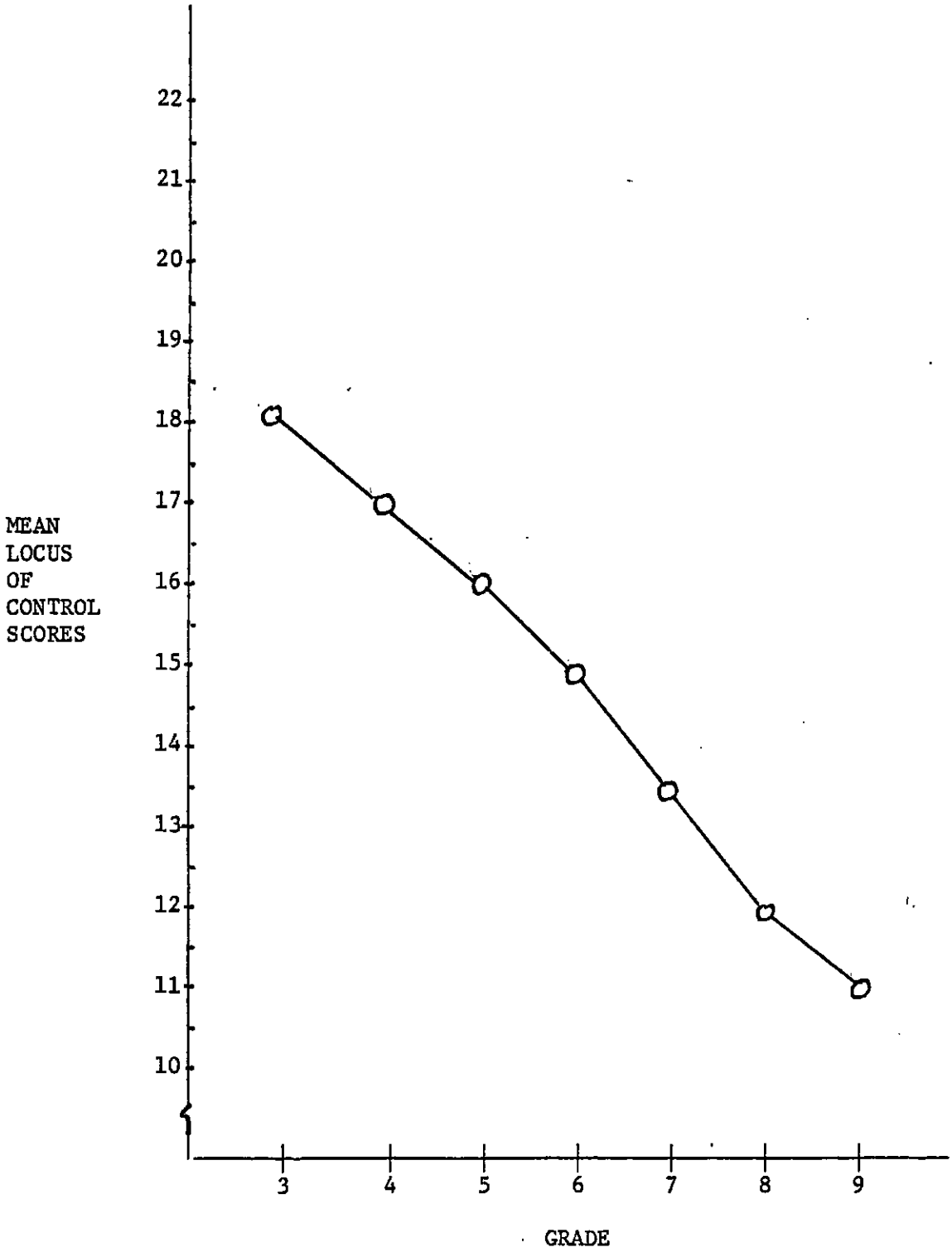

Figure 5. Mean Locus of Control Scores by Grade of the Total Non-Dene Students

Multiple Scheffé comparisons were performed to examine differences between means of locus of control scores by grade. Since this procedure is rigorous, a less conservative significance level of $p < .10$ was used (Table 24). There was a significant shift ($p < .01$) in locus of control for the total non-Dene group between grades three and seven.

Table 24

Scheffé Test of Differences Between Grade Group Means of the Total Non-Dene Population for Locus of Control Scores

Grade	Grade						
	3	4	5	6	7	8	9
3		1.03	1.89	3.04	4.49*	6.07*	6.90*
4			0.86	2.01	3.46***	5.04*	5.87*
5				1.15	2.61	4.18**	5.01*
6					1.45	3.03	3.86***
7						1.58	2.41
8							0.83
9							

*$p < .01$
**$p < .05$
***$p < .10$

If one considers only the relationship of male and female non-Dene locus of control scores (Table 24), there is a significant difference t (250) = 2.39, $p < .02$ in favour of the males. However, when one takes into consideration grade and ethnicity and sex over the total group and performs a three-way analysis of variance (Table 32), the interaction of sex and ethnicity and grade of a subject and locus of control is not significant.

Table 25

Means and Standard Deviations of Locus of Control Scores for All the Female and Male Non-Dene Students

	N	$\bar{X}$ LOC SCORE	S.D.
Female	121	15.70	4.74
Male	131	14.27	4.77

Table 26 presents the means and standard deviations of the locus of control scores for the non-Dene students by sex and grade. This is graphically illustrated in Figure 6. Both Table 26 and Figure 6 indicate that there is a growth in internality over grade for both female and male non-Dene students. The one-way analysis of variance (Table 27) for male non-Dene students and the one-way analysis of variance (Table 28) for female Dene students as well as the lack of interaction effects of grade by sex in the three-way analysis of variance (Table 32) supports the fact of the growth of internality over grade.

Multiple comparisons by a Scheffé test were performed to examine differences between locus of control scores of each of male and female non-Dene students by grade. The results are given in Table 29 and Table 30, respectively. The first significant difference in means was between grades three and nine ($p < .01$) for the non-Dene male group. For the non-Dene female group the first significant difference in means was between grades three and eight ($p < .01$). The only other significant difference in means was between grades four and eight ($p < .10$).

Within groups there was no significant difference between locus of control scores by sex between grades. The t tests between means of each

sex by grade support that statement.

Table 26

Means and Standard Deviations of the Locus of Control Scores for the Non-Dene Group by Sex and Grade

Grade	MALE			FEMALE		
	N	$\bar{X}$ LOC SCORE	S.D.	N	$\bar{X}$ LOC SCORE	S.D.
3	15	17.20	4.28	22	18.79	3.03
4	12	17.50	4.76	22	16.73	4.61
5	22	16.04	4.34	20	16.25	4.05
6	23	14.35	4.72	23	15.61	4.06
7	28	13.11	3.76	13	14.46	5.88
8	15	12.60	4.37	13	11.23	3.79
9	16	10.13	4.00	8	13.12	5.99

Table 27

A One-Way Analysis of Variance for the Locus of Control Scores for Male Non-Dene Students by Grade

Source	df	m.s.	F
Grade	6	113.001	6.153*
Error	124	18.368	

*$p < .001$

Table 28

A One-Way Analysis of Variance for the Locus of Control Scores for Female Non-Dene Students by Grade

Source	df	m.s.	F
Grade	6	90.994	4.817*
Error	114	18.889	

*$p < .001$

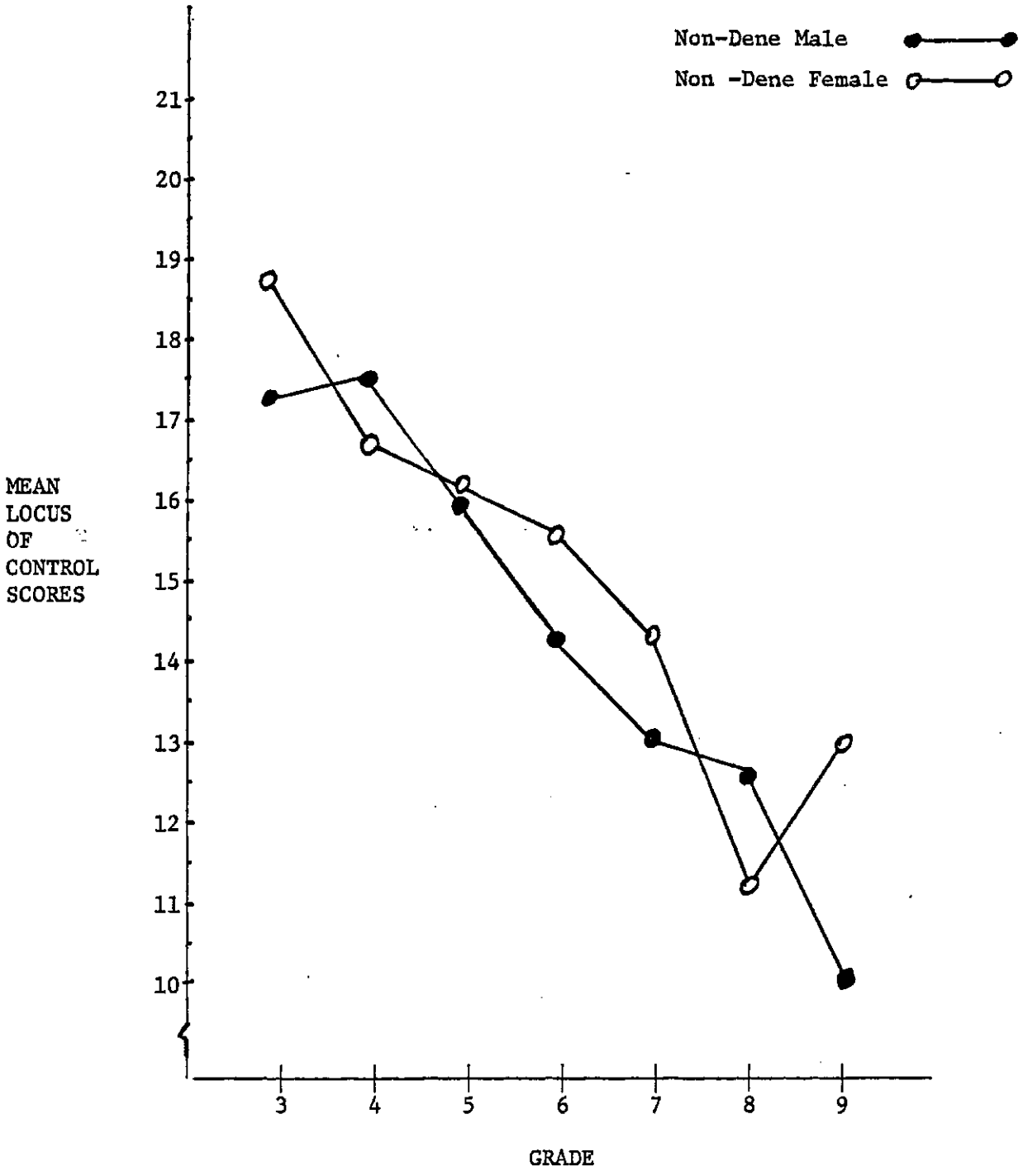

Figure 6. Mean Locus of Control Scores of the Non-Dene Male and Non-Dene Female Students

Table 29

Scheffé Test of Differences Between Non-Dene Male Grade Group Means for Locus of Control Scores

Grade	Grade						
	3	4	5	6	7	8	9
3		0.30	1.16	2.85	4.09	4.60	7.07*
4			1.46	3.15	4.39	4.90	7.37*
5				1.69	2.93	3.44	5.91**
6					1.24	1.75	4.22
7						0.51	2.98
8							2.47
9							

*$p < .01$
**$p < .05$

Table 30

Scheffé Test of Differences Between Non-Dene Female Grade Group Means for Locus of Control Scores

Grade	Grade						
	3	4	5	6	7	8	9
3		2.06	2.54	3.18	4.36	7.56*	5.67
4			0.48	1.12	2.17	5.50***	3.61
5				0.64	1.79	5.02	3.13
6					1.15	4.38	2.49
7						3.23	1.34
8							1.89
9							

*$p < .01$
***$p < .10$

A Comparison of Dene and Non-Dene Groups

Table 29 presents the means and standard deviations by ethnicity and grade. These results are graphically presented in Figure 7. Initial analysis by means of t tests indicated that there were significant differences within grades three, four and five but not within grades six, seven, eight and nine.

Table 31

Means and Standard Deviations of Locus of Control Scores of the Total Group by Grade and Ethnicity

Grade	DENE			NON-DENE		
	N	$\bar{X}$ LOC SCORES	S.D.	N	$\bar{X}$ LOC SCORES	S.D.
3	20	20.45	3.90	37	18.03	3.60
4	21	20.10	3.28	34	17.00	4.61
5	23	18.17	4.12	42	16.14	4.15
6	19	15.16	5.21	46	14.98	4.40
7	19	14.89	2.83	41	13.54	4.51
8	9	12.56	3.68	28	11.96	4.10
9	7	13.71	3.99	24	11.13	4.84

A more detailed analysis of the data was performed using a three-way analysis of variance (Table 32). That analysis indicated that there were no overall interaction effects of grade and ethnicity, but that ethnicity alone is a significant factor.

Hypothesis 1

For the dependent variable, locus of control, there are no significant effects of (a) grade, (b) sex, (c) ethnicity, (d) the interaction of grade and sex, (e) the interaction of grade and ethnicity, (f) the

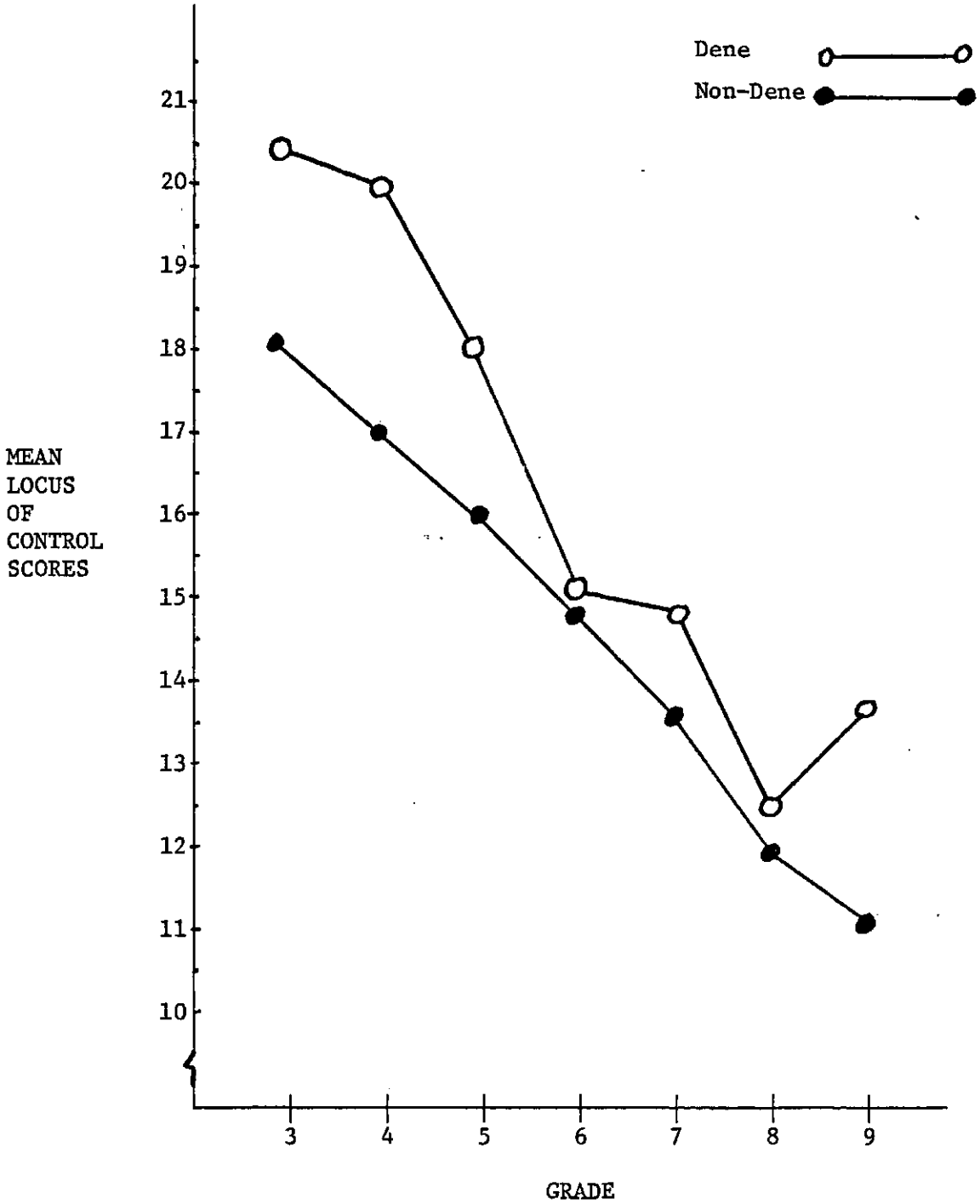

Figure 7. Mean Scores by Grade of the Dene and Non-Dene Students

interaction of sex and ethnicity, (g) the interaction of grade and sex and ethnicity.

Three-way analysis of variance of the data (Table 32) yielded significant differences for grade F (6,370) = 20.441, $p < .001$, and for ethnicity F (1,370) = 13.348, $p < .001$. The three-way analysis of variance was not significant for sex F (1,370) = 37.185, $p = 0.149$, grade and sex F (6,370) = 0.351, $p = 0.909$, grade and ethnicity F (6,370) = 0.804, $p = 0.567$, sex and ethnicity F (1,370) = 0.029, $p = 0.865$, and for grade and sex and ethnicity F (6,370) = 0.987, $p = 0.434$.

Results lead to the rejection of Hypotheses 1a, 1c and to the acceptance of hypotheses 1b, 1d, 1e, 1f and 1g.

Table 32

A Three-Way Analysis of Variance of Locus of Control Scores by Grade by Sex by Ethnicity

Source of Variance	df	m.s.	F
Grade	6	363.645	20.441*
Sex	1	37.185	2.090
Ethnicity	1	237.458	13.348*
Grade by Sex	6	6.252	0.351
Grade by Ethnicity	6	14.299	0.804
Sex by Ethnicity	1	0.516	0.029
Grade by Sex by Ethnicity	6	17.559	0.987
Within	342	17.790	

*$p < .001$

Hypothesis 2

For the dependent variable, locus of control, there are no significant effects of (a) age, (b) sex, (c) ethnicity, (d) interaction of age and sex, (e) interaction of age and ethnicity, (f) interaction of sex and

ethnicity, (g) interaction of age and sex and ethnicity.

Table 33

A Three-Way Analysis of Variance of Locus of Control Scores by Age by Sex by Ethnicity

Source of Variance	df	MS	F
Age	8	176.480	9.148*
Sex	1	39.023	2.023
Ethn	1	430.999	22.341*
Age by Sex	8	19.574	1.015
Age by Ethnicity	8	29.117	1.509
Sex by Ethnicity	1	3.907	0.203
Age by Sex by Ethnicity	7	4.539	0.235
Within	335	19.292	

*$p < .001$

The three-way analysis of variance of the data (Table 33) was significant for age $F(8,370) = 9.148$, $p < .001$, and for ethnicity $F(1,370) = 22.341$, $p < .001$. The three-way analysis was not significant for sex $F(1,370) = 2.023$, $p = 0.156$, age by sex $F(8,370) = 1.015$, $p = 0.415$, age by ethnicity $F(8,370) = 1.509$, $p = 0.153$, sex by ethnicity $F(1,370) = 0.203$, $p = 0.653$, and for age by sex by ethnicity $F(7,370) = 0.235$, $p = 0.976$.

Results lead to the rejection of hypotheses 2a, 2c and to the acceptance of hypothesis 2b, 2d, 2e, 3f and 2g.

Hypothesis 3

The regression equations predicting the locus of control scores from age, sex, grade, and ethnicity will not explain a significant proportion of the locus of control score.

Table 34 presents the Hierarchical Multiple Regression Analysis of

Variance. Table 35 presents the stepwise regression analysis of variance. Table 36 presents the multiple R, R^2, standard error of estimate and overall F values for regression equations predicting locus of control.

The results of the hierarchical multiple regression analysis state that age $F(1,348) = 73.54$, $p < .001$, grade $F(6,348) = 9.89$, $p < .01$, and ethnicity $F(1,348) = 8.95$, $p < .001$ are significant variables in the prediction of locus of control.

Table 34

Hierarchical Multiple Regression Analysis of Variance of the Dependent Variables Locus of Control Scores

Source of Variance	df	m.s.	F
Age	1	1291.42	73.54*
Grade	6	173.62	9.89*
Sex	1	47.57	2.71
Ethnicity	1	157.18	8.95*
Grade x Sex	6	7.12	0.41
Grade x Ethnicity	6	13.17	0.75
Error	348	17.56	

The hierarchical procedure assessed main effects in the order: age, grade, sex, ethnicity, grade x sex, and grade x ethnicity.

*$p < .001$

Because age and grade are closely related, a stepwise regression analysis was performed on the data to see which of age and/or grade contributed to the variance. The results of this analysis (Table 35) indicate that age and the combination of age and ethnicity contribute the most to the variance.

A more detailed analysis of the data is presented in Table 36. An

examination of the data reveals that age contributed 14.7% of the variance, ethnicity 5.1% of the variance, and grade four plus ethnicity contributed 1% of the variance.

Table 35

Stepwise Regression With Locus of Control the Dependent Variable

Source of Variance	df	m.s.	F
Age	1	1291.42	68.08*
Age + Ethnicity	2	448.70	23.65*
Age + Ethnicity + Grade 4	3	85.57	4.51**

*$p < .001$
**$p < .05$

Table 36

Multiple R, R^2, Standard Error of Estimate and Overall F Values for Regression Equations Predicting Locus of Control

	Multiple R	R^2	Standard Error	Overall F Value
Age	0.384	0.147	4.51	63.549
Ethnicity	0.445	0.198	4.38	45.423
Grade 4 + Ethnicity	0.456	0.208	4.356	37.075
Grade 8	0.466	0.217	4.337	25.305

Figure 8 graphically represents the mean locus of control scores by age of the total group. Figure 9 graphically illustrates the mean locus of control scores by age of the Dene and non-Dene students (age 16 was omitted because of the low N's in each cell. Age 16 was not included with age 15 because of the small N's and extreme scores which would skew the results).

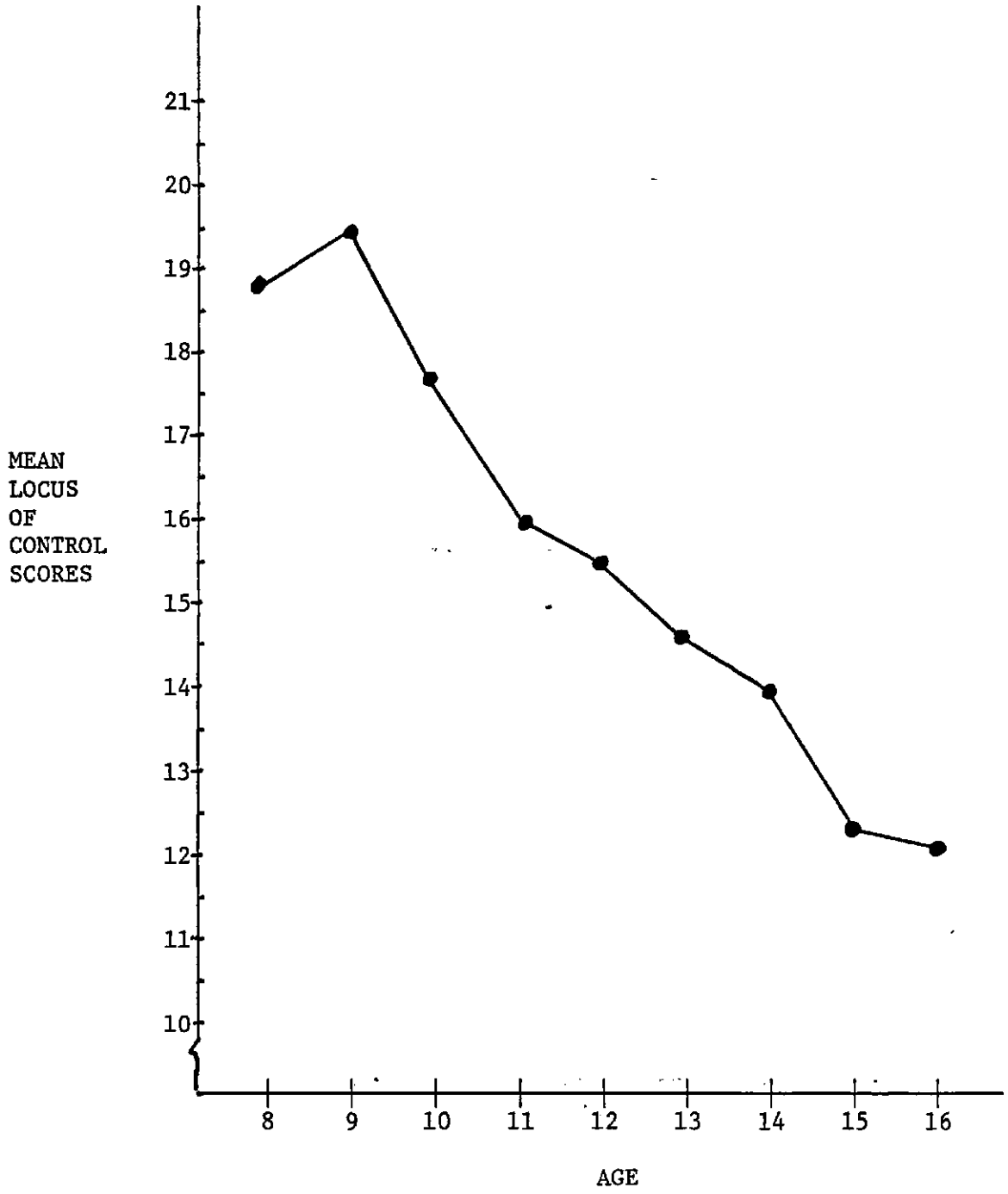

Figure 8. Mean Locus of Control Scores by Age of the Total Group

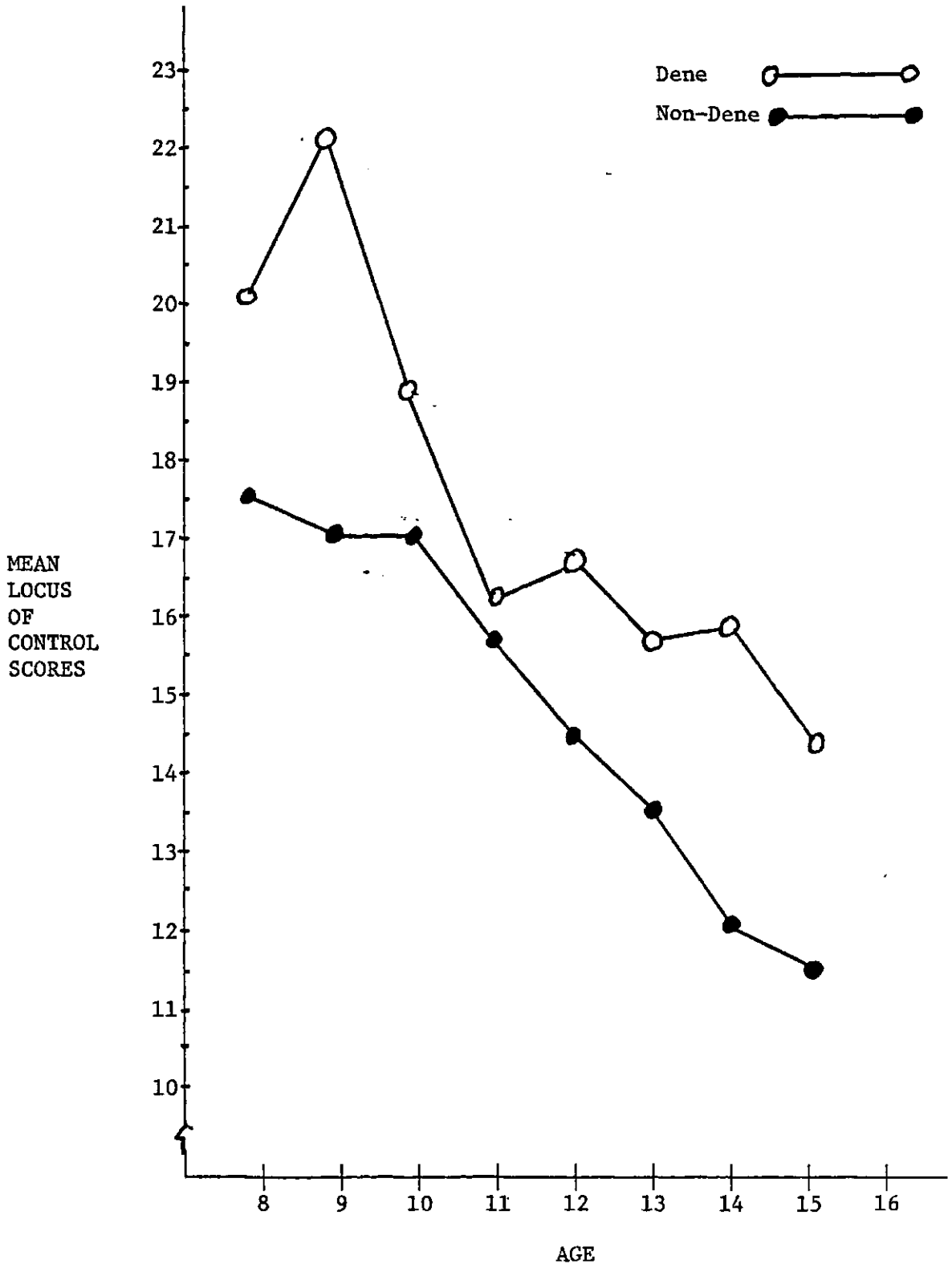

Figure 9. Mean Locus of Control Scores by Age of the Dene and Non-Dene Students

Hypothesis 4

The regression equations predicting the composite CTBS grade equivalent composite score (achievement score) from age, sex, locus of control, and ethnicity will not explain a significant proportion of the total achievement score.

Table 37 presents the hierarchical multiple regression analysis of variance. Table 38 presents the stepwise regression analysis and Table 39 presents the multiple R, R^2 and standard error of estimate and overall F values for regression equations predicting achievement.

Table 37

Hierarchical Multiple Regression Analysis of Variance of the Dependent Variable Achievement Scores

Source of Variance	df	m.s.	F
Locus of Control	1	57993.08	493.94*
Age	1	44487.80	378.91*
Grade	6	18515.77	157.70
Sex	1	1242.92	10.59*
Ethnicity	1	62.48	0.53
Grade x Sex	6	201.72	1.72
Grade x Ethnicity	6	145.24	1.23
Error	347	117.41	

The hierarchical procedure assessed main effects in the order: age, grade, sex, ethnicity, grade x sex, and grade x ethnicity.

*$p < .001$

The results of the hierarchical multiple regression analysis state that locus of control $F(1,347) = 378.91$, $p < .001$, grade $F(6,347) = 157.70$, $p < .001$, and sex $F(1,347) = 10.59$, $p < .001$ are significant variables in the prediction of achievement scores.

Because age and grade are closely related, a stepwise regression analysis was performed on the data to see which of age and/or grade contributed to the variance. The results, as illustrated in Table 38, indicate that age, locus of control, and grade four plus ethnicity contribute the most to the variance.

Table 38

Stepwise Regression With Achievement Scores the Dependent Variable

Source of Variance	df	m.s.	F
Age	1	82475.27	323.48*
Locus of Control	1	31234.83	122.51*
Grade 4 + Ethnicity	1	15775.331	61.87*
Error	366	254.96	

*$p < .001$

A more detailed analysis of the data (Table 37) indicates that age contributes 41.3% of the variance, locus of control 10% and grade four plus ethnicity 2% of the variance.

Table 39

Multiple R, R^2, Standard Error of Estimate and Overall F Values for Regression Equations Predicting Achievement Scores

Variable	Multiple R	R^2	Standard Error	Overall F Value
Age	0.643	0.413	17.85	258.89
Locus of Control	0.716	0.513	16.28	193.41
Grade 4 + Ethnicity	0.730	0.533	15.97	139.10
Grade 3	0.742	0.551	15.67	112.17

Table 40

Regression Analysis of Achievement Scores

Variable	Multiple R	R^2	R^2 Change
Age	0.64	0.412	0.412
Locus of Control	0.71	0.513	0.100
Grade 4 + Ethn	0.72	0.532	0.019
Grade 3	0.74	0.551	0.018
Grade 5	0.76	0.577	0.026
Grade 4	0.79	0.626	0.048
Grade 6	0.82	0.676	0.0496
Grade 7	0.85	0.739	0.063
Grade 8	0.88	0.779	0.040
Sex	0.88	0.785	0.006
Gr 6 + Sex	0.88	0.789	0.066
Gr 6 + Ethn	0.88	0.789	0.00078
Gr 4 + Sex	0.88	0.790	0.00074
Gr 8 + Ethn	0.88	0.79	0.00072
Gr 5 + Ethn	0.88	0.79	0.00049
Gr 3 + Ethn	0.89	0.79	0.00035
Ethnicity	0.89	0.79	0.00055
Gr 7 + Ethn	0.89	0.79	0.002
Gr 3 + Sex	0.89	0.79	0.00021
Gr 5 + Sex	0.89	0.79	0.00018
Gr 8 + Sex	0.89	0.79	0.00035
Gr 7 + Sex	0.89	0.79	0.00055
Sex + Eth	0.89	0.79	0.00009

Chapter V

DISCUSSION AND CONCLUSION

A major thrust of this research was to examine the locus of control beliefs held by a group of Dene and non-Dene students with a common school district environment. The specific aims were to gather basic data on each group as to the movement of internal to external locus of control over grade, and to examine the effects of age, sex and ethnicity. Grade was initially chosen as a medium by which to examine the growth of locus of control. That was the direction of researchers such as Crandall et al. (1965) and Nowicki and Strickland (1973) had previously taken. The relationship between locus of control and achievement was also briefly examined.

In this chapter the findings are discussed in conjunction with the hypotheses tested. The findings with respect to Hypotheses 1 and 2 are presented separately, then discussed together under the following headings: Total Group, Dene Group, and Non-Dene Group. Hypotheses 3 and 4 are then discussed in turn. Implications of the findings for the education of Dene and non-Dene students are followed by a brief summary.

Hypothesis 1

For the dependent variable, locus of control, there are no significant effects of (a) grade, (b) sex, (c) ethnicity, (d) the interaction of grade and sex, (e) the interaction of grade and ethnicity, (f) the

interaction of sex and ethnicity, and (g) the interaction of grade and sex and ethnicity.

Hypotheses 1(a) and 1(c) were rejected ($p < .001$).

Hypotheses 1(b), 1(d), 1(e), 1(f) and 1(g) were accepted.

Hypothesis 2

For the dependent variable, locus of control, there are no significant effects of (a) age, (b) sex, (c) ethnicity, (d) interaction of age and sex, (e) interaction of age and ethnicity, (f) interaction of sex and ethnicity, and (g) interaction of age and sex and ethnicity.

Hypotheses 2(a) and 2(c) were rejected ($p < .001$).

Hypotheses 2(b), 2(d), 2(e), 2(f) and 2(g) were accepted.

Total Group

Overall the results of the 370 subjects' responses to the Nowicki-Strickland Locus of Control Scale for Children indicated a significant movement on the continuum of externality to internality over both grade and age. Age, according to a stepwise regression analysis, was the dominant factor over grade. The growth of internality over age, as found in this study, is consistent with previous research (Boor, 1974; Gruen, Korte & Baum, 1974; Lao, 1976; Nowicki-Strickland, 1973; Penk, 1969; Wolf et al., 1982).

It should be noted that age and grade have been used interchangeably in the norming of the Nowicki-Strickland Scale. "Table 1 presents the means and standard deviations of the Nowicki-Strickland Scale scores for males and females at each grade level; it shows that students' responses become more internal with age" (Nowicki-Strickland, 1973, p. 151).

(Italics are this researchers.)

Considering the development of internality over grade, one significant shift occurs between grade three and six. There are other significant shifts, however, that shift is important in that it would indicate that encouragement and fostering of internality should occur between those grades if internality is considered an overall desirable personality factor.

The present study indicates that grade four interacted significantly with ethnicity. This is consistent with the findings of Coady et al. (1981), who stated that "internality/externality is established by the fourth grade, at least for male subjects" (p. 229).

Sex and Locus of Control

If the total male mean scores and the total female mean scores are taken in isolation, there were significant sex differences. That is, the females as a total group were more external. However, when other variables are taken into consideration such as age, grade and ethnicity, that significant difference no longer exists. Rotter (1966) suggested in his studies that sex differences in locus of control appear to be minimal. Studies by Gruen and Ottinger (1969), Halpin et al. (1981), Nowicki and Strickland (1973) and Penk (1969) did not report any sex differences. However, Feather (1967) and James in 1958 (1978a) reported that adult females were more external. James (1978a) reported that adult females were now more internal than adult males. Gruen, Korte and Baum (1974) reported that grade school females were internal. Crandall et al. (1965) and Newhouse (1974) both state that grade school girls accept more blame for their actions than do boys when internality/externality are measured

on the IAR scale.

The female mean scores appear to show a reversal from internality to externality between grades eight to nine. This same phenomenon is also indicated in Table 1 of Nowicki-Strickland's (1973) work (p. 149). This apparent reversal is not statistically significant in the present study.

The male mean locus of control scores for the total group indicate a more steady development on the internal-external continuum.

Dene Group

Overall, there was a significant shift from externality to internality for the Dene group over grades three to nine. When the grade group mean scores are examined, there is an apparent reversal of direction from grade eight to nine in an external direction. It would seem that the male Dene scores would account for the apparent reversal. This reversal, however, is not statistically significant. The lack of significance and/or apparent reversal may in fact be due to a low N (three Dene male grade nine students). Or, as Martin (1978) indicated, this difference could be a result of how native students react to adolescence.

Considering the development of internality over grade, the Dene male students seem to develop in an erratic pattern, while the Dene female mean scores decrease gradually over grade. When age and mean scores are considered, the same pattern emerges. The Dene male mean scores undergo only one significant change and that is between grades three and eight, while the Dene female undergo significant changes in mean scores between four and six, four and seven, four and eight, and four and nine. However, at the grade four level the Dene female mean

scores are significantly more external than the male Dene mean scores. The development of internality is statistically significant between grades four and six ($p < .10$); four and seven ($p < .05$); four and eight ($p < .10$); and four and nine ($p < .10$).

Tyler and Holsinger (1975) found that Indian female students were more external in grades seven, nine and eleven, but at grade four they were more internal than the Indian grade four male students. Their finding, "although in the predicted direction the difference at the fourth grade level was not significant" (p. 152).

Although Tyler and Holsinger's (1975) findings are not in agreement with the present study at the grade four level, it is interesting to note that "grade four" effects seem to be a significant point in the curriculum research.

Sex and Locus of Control

There was no significant difference between the total Dene male mean scores and the total Dene female mean scores. Martin (1978), using the Nowicki-Strickland Scales in his comparative study of Indian and white students and locus of control, did not report any significant differences in scores between the Indian male and female students. Tyler and Holsinger (1975) stated that "no support was obtained for the hypothesis that Indian girls are more internal than Indian boys" (p. 154). In addition, Halpin et al. (1981), using the Crandall et al. (1965) Intellectual Achievement Responsibility Scale rather than the Nowicki-Strickland Scale, found similar results in their comparative study of American Indians and whites on the dimension of locus of control.

Non-Dene Group

The mean locus of control scores for the non-Dene group move significantly in an internal direction from grades three to nine. There are nine significant differences toward internality between grades for the total non-Dene group. The differences are between grades three and seven; three and eight; three and nine; four and seven; four and eight; four and nine; five and eight; five and nine; and six and nine.

Sex and Locus of Control

If one considers only the relationship of male and female non-Dene mean locus of control scores, there is a significant difference between the two groups. The males are more internal. However, when grade and ethnicity are taken into consideration over the total group, the difference is not supported by the analysis.

The apparent shift from internality to externality between grades eight and nine for the female non-Dene mean locus of control scores is not statistically significant. Within the non-Dene group, however, there are significant differences in mean male scores between grades three and nine; four and nine; and five and nine. The female mean scores are significantly different between grades three and eight and four and eight.

With the exception of grade four for the males, and grade eight and nine for the females, there is a fairly even development for both sexes over grades three to nine. Mean scores by age and sex indicate that there is a more even development of internality for the males than the females. At age "sixteen" (age 16 was the category assigned to those who were 16 or more years of age) both male and female scores indicate a reversal. However, the low N's - three for males, and one for females -

suggest that this finding be interpreted with caution.

Dene and Non-Dene: A Comparison

The Dene students are significantly more external than the non-Dene students' scores over grades three to nine. There is also a significant difference, with the Dene being more external, when the locus of control scores are compared over age.

Within grades, there were significant differences between Dene and non-Dene students' mean scores in grades three, four and five but not in grades six through nine. Martin (1978) reported that Indian children were more external in grades four, eight and twelve than their white counterparts. Tyler and Holsinger (1975) reported that Indian female children in grades four, seven and nine, and Indian male children in grade four to be more external than their white classmates. The other Indian children's mean locus of control scores indicated a difference in an external direction. However those results were not significant. Tyler and Holsinger (1975) also reported that there were no significant differences between the two groups at the grade 11 level. Halpin et al. (1981), who used the IAR scale, did not find any differences between the Indian and white students' mean scores at the junior high level, thereby providing support for the present findings at the junior high or grade six to nine levels.

Hypothesis 3

The regression equations predicting the locus of control scores from age, sex, grade and ethnicity will not explain a significant proportion of the total locus of control score.

The results indicate that age and ethnicity are significant predictors of locus of control scores. They account for 19.8% of the variance. A third significant factor entered into the regression equation and that was grade four plus ethnicity. This result is also mentioned by Martin (1978) who stated that "it seems that Indian and white children do differ in their locus of control orientation and this difference is evident by the time the students reach the fourth grade" (p. 28). Tyler and Holsinger (1975) reported that at the fourth grade level ethnic differences were significant with the Indians more external than whites. They found a grade by ethnicity interaction. This study did not find an overall ethnicity by grade interaction as did Tyler and Holsinger. However, there were significant differences between Dene and non-Dene students in grades three, four and five but not for grades six, seven, eight and nine.

Hypothesis 4

The regression equations predicting the Canadian Test of Basic Skills (CTBS) grade equivalent composite score (achievement score) from age, sex, locus of control and ethnicity will not explain a significant proportion of the total achievement score.

The above hypothesis developed out of the study and was not part of the original proposal. It was interesting to note that age, locus of control and grade four plus ethnicity contributed significantly to the prediction of the achievement scores.

To further explore the relationship of age, sex and ethnicity to achievement, a three-way analysis of variance was performed. The results (Table 41) were significant for age $F(8,335) = 40.934$, $p < .001$,

ethnicity $F(1,335) = 27.076$, $p < .001$, and sex approached significance $F(1,335) = 3.125$, $p = 0.78$. The three-way analysis was not significant for age by sex $F(8,335) = 0.635$, $p = 0.748$, for age by ethnicity $F(8,335) = .461$, $p = 0.883$, for sex by ethnicity $F(1,335) = 0.774$, $p = 0.380$, and for age by sex by ethnicity $F(7,335) = .410$, $p = 0.896$.

The significant difference in mean achievement scores by age is illustrated in Figure 10.

These results would indicate, as does previous research, that internality is correlated with achievement; however age is a much better predictor.

Koenig (1981) concludes in her study that native and non-native peoples have a significant difference in their learning styles. It could be postulated that the reason for the statistically significant difference in the achievement scores of the Dene and non-Dene children could be due to learning styles. A Dene child, who is external and a holistic thinker, must transfer to linear thought and internality at the beginning of his/her school career. On the other hand, the non-Dene child has experienced linear thought and the antecedents of internality before his school career begins and thus does not have to make any major adjustment at the start of his/her school life.

Implications of Findings for the Education of Dene and Non-Dene Students

The implications for the education of both Dene and non-Dene students are discussed under the headings: Externality to Internality, Teaching Style and Learning Style, and Summary.

The results of this research confirm that both Dene and non-Dene

Table 41

A Three-Way Analysis of Variance of Achievement Scores by Age, by Sex, by Ethnicity

Source	df	ms	F
Age	8	11594.104	40.934*
Sex	1	885.056	3.125**
Ethnicity	1	7669.087	27.076*
Age by Sex	8	179.866	0.635
Age by Ethnicity	8	130.690	0.461
Sex by Ethnicity	1	219.169	0.774
Age by Sex by Ethnicity	7	116.278	0.410
Within	335	283.242	

*$p < .001$

**$p < .08$

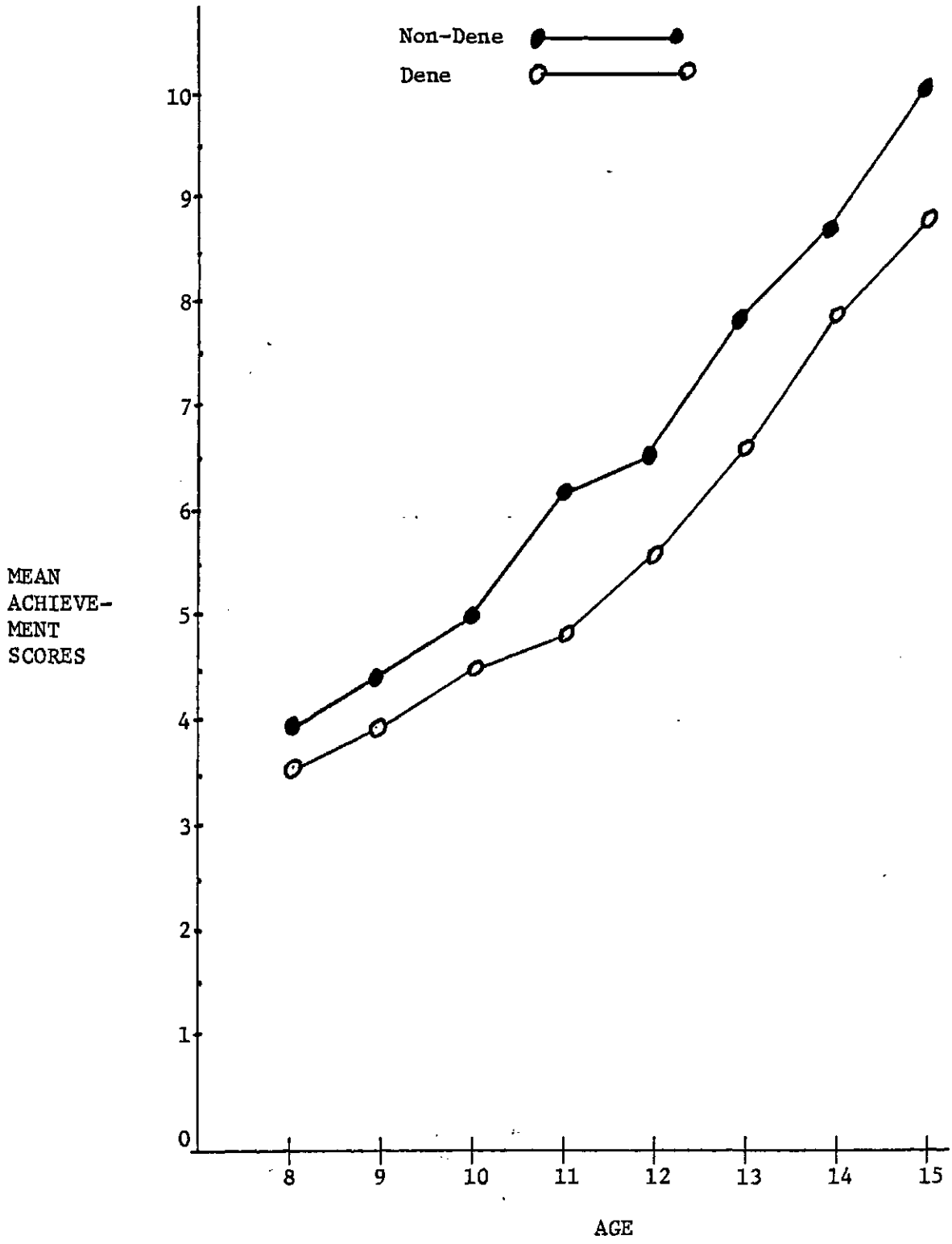

Figure 10. Mean Achievement Scores by Age of the Dene and Non-Dene Students

students develop on the continuum from external locus of control to internal locus of control over both age and grade. However, the Dene group is significantly more external than the non-Dene group. With this knowledge in hand educators have several courses of action open to them. They could try to change a person from being external to internal, or they could use the "externality" to the learner's advantage in the classroom. The overall findings indicate that both within and between groups there are differences in "internality" and externality." These differences could be considered as differences in learning style. Thus it could be advantageous to change the teaching style to match the learning style of the student.

Externality to Internality

Vasquez (1974) states that nearly all the advantages attributable to educational success are on the side of the internal person. He suggests that teachers should actively foster internality within the classroom. He recommends four strategies to accomplish this task. The first he suggests is that the students should be made aware and become cognizant of the cause-effect relationship. This should be done according to Vasquez by an examination of inanimate objects, such as a forest fire, and then proceed to an examination of themselves so that they can understand and accept their own behaviour as it is related to their own success and/or failure. The second way that he suggests to help externals become internals is for teachers to help the children formulate realistic goals which they can master and thus attribute success to their own efforts. A third technique that is offered to teachers to assist a child develop from external to internal is for the teacher to develop

activities that require internal attribution. He suggests two such activities; creative work with verbal praise, and peer tutoring by the external child. Vasquez's last suggestion is that the teacher should actively and pointedly question external students on stories which have clear success and/or failure components. The questions should be worded in such a way as to have the external child verbalize the reasons why the character in the story succeeded or failed and furthermore link the success and/or failure to the degree of "trying hard" and "feeling good" when the tasks have been completed.

Crandall (1976) suggests that external children remove themselves from learning situations because of the failures they have experienced. In this study, Dene children were not only significantly more external but also had significantly lower achievement scores.

Crandall (1976) suggests that Computerized Assisted Instruction (CAI) develops internality in external children because the "powerful other," be it teacher, parent or teacher-aide, is removed from the immediate scene. The child, in his opinion, must take the full responsibility for his actions and that computer assisted instruction helps the child accomplish that task. The reasons that he gives are that CAI provides immediate feedback, specific instructions and that success activities can be programmed on the software. His argument is enhanced by the subjective reports on CAI's success in the Los Nietos School District - a Mexican-American School District in California.

Teaching Style and Learning Style

Most of the teachers of Dene students are non-Dene. Those teachers are successful university graduates and more likely to be "internal"

persons. The results of this study state that the Dene students tend to be "external." There is a potential situation where the orientations of the teacher and the student are in conflict. Maybe it is not the child who needs to learn "inner control" or "internality;" perhaps it is important that the teacher's strategies change to meet the student's learning style. This does not mean that we need segregated classrooms to accommodate this change. Albeit, the integrated classroom is a challenge to the ingenuity and knowledge of the teacher because of the differences in the learning styles of the students within that class. Wilson (1978) indicates that students who are in a cross-cultural setting (integrated) do achieve better than those who are not.

Koenig (1981) studied the cognitive styles of native and non-native people of northern Canada and Alaska. One of her conclusions was that there is a significant difference not only between native and non-native peoples but also within the native groups (Inuit, Indian and Metis). The present study excluded Inuit students because the researcher considered the Inuit to be a separate and unique cultural group unto itself. In addition, the present study did not differentiate between Indian and Metis as Koenig (1981) did in her study. If locus of control, as a personality variable, can be considered as part of a person's learning style, then Koenig's (1981) study has a bearing on the findings of this research. Specifically, the finding that there is a difference in this study between the Dene and non-Dene in terms of locus of control.

She states that in a cross-cultural situation where the teacher is non-native and the students native there is a high probability that the teaching styles are out of step with the learning styles. The teachers with the university backgrounds think in terms of cause and effect while

the "Indians," according to Koenig, have a relational style. The cause-effect relationship is linear thought and this might be where the idea of Vasquez (1974) of teaching cause and effect directly may not work. "Relational style" as defined by Koenig refers "to those cognitive behaviours which tended to be subjective, holistic, orientated in social relationships and values, specific, field-dependent, simply stated and related to experience" (Koenig, 1981, p. 10).

The suggested techniques of instruction for native peoples following the above were "all three groups prefer that material be presented in a well organized structured manner" (p. 190). That seems to follow not only the ideas of Crandall (1976) but also the techniques of many "university trained" teachers.

Koenig (1981) also stated that native persons also prefer people orientated material. "It is suggested that the social expectations, norms and interacting patterns be taught and discussed as part of the program and not left to incidental learning" (p. 168). Vasquez's ideas about relating stories about success and failure and actively questioning students on those stories as to the social expectations could possibly fit into the above framework.

Another finding by Koenig (1981) was that the Metis group approached learning in a somewhat relational manner but "with a strong reliance on authority" (p. 190). This would seem on the surface to indicate a tendency to be "external" in orientation.

Summary

Both Dene and non-Dene children do progress on the continuum of externality to internality, but at significantly different developmental

rates.

Crandall (1976), Koenig (1981) and Vasquez (1974) offer clear suggestions for the teacher. Vasquez through the child's locus of control by direct action; Crandall through the use of computer assisted instruction; and Koenig through the changing of "teaching style." Other suggestions could be to use direct teaching techniques and by making clear active demands on the learner.

It has been postulated that the statistically significant differences in achievement development between the Dene and non-Dene children could be due to the fact that at the beginning of their school life the Dene children have to transfer from holistic thinking to linear thought.

In this researcher's opinion the most important thread is to have the knowledge of a student's orientation, and to be sensitive to the needs of the individual learner, be they Dene or non-Dene. If externality or internality inhibits the learning process then the teacher could change their instructional style and/or the methods of instruction to suit the learner's strengths. It should be noted that in this study locus of control contributed to 10% of the variance in achievement and age 41%. In summary, it is important to be knowledgeable, aware and sensitive to the needs of the learner so that appropriate instructional and reinforcement strategies may be used to assist the person as he/she learns to grow and develop.

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APPENDIX

The Nowicki-Strikland Locus of Control Scale*

The Nowicki-Strickland Locus of Control scale is a paper and pencil measure consisting of 40 questions which are answered either yes or no by placing a mark next to the question. The higher the score the more external the orientation.

Nowicki-Strickland Scale

(Y) 1. Do you believe that most problems will solve themselves if you just don't fool with them?

(N) 2. Do you believe that you can stop yourself from catching a cold?

(Y) 3. Are some kids just born lucky?

(N) 4. Most of the time do you feel that getting good grades means a great deal to you?

(Y) 5. Are you often blamed for things that just aren't your fault?

(N) 6. Do you believe that if somebody studies hard enough he or she can pass any subject?

(Y) 7. Do you feel that most of the time it doesn't pay to try hard because things never turn out right anyway?

(Y) 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?

(N) 9. Do you feel that most of the time parents listen to what their children have to say?

(Y) 10. Do you believe that wishing can make good things happen?

(Y) 11. When you get punished does it usually seem it's for no good reason at all?

(Y) 12. Most of the time do you find it hard to change a friend's (mind) opinion?

(N) 13. Do you think that cheering more than luck helps a team to win?

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*From Nowicki-Strickland (1973).

(Y) 14. Do you feel that it's nearly impossible to change your parent's mind about anything?

(N) 15. Do you believe that your parents should allow you to make most of your own decisions?

(Y) 16. Do you feel that when you do something wrong there's very little you can do to make it right?

(Y) 17. Do you believe that most kids are just born good at sports?

(Y) 18. Are most of the other kids your age stronger than you are?

(Y) 19. Do you feel that one of the best ways to handle most problems is just not to think about them?

(N) 20. Do you feel that you have a lot of choice in deciding who your friends are?

(Y) 21. If you find a four-leap clover do you believe that it might bring you good luck?

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

(Y) 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?

(Y) 24. Have you ever had a good luck charm?

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

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

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

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

(Y) 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?

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

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

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

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

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

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

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

(Y) 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?

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

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

(n) 40. Do you think it's better to be smart than to be lucky?