The effects of gender and ethnicity upon locus of control of gifted Grade 8 students

by

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Abstract

Little research has addressed the relationship between gender, ethnicity, and locus of control (LOC) among gifted adolescents. This study examined a group of 67 gifted Grade 8 students, 41 Asian-Canadian and 26 Caucasian, who received the Intellectual Achievement Responsibility Questionnaire (IAR). A two-factor MANOVA, with gender and ethnic background as independent factors, was used to examine the relationship between positive (I+) and negative (I−) internal locus of control and gender and ethnicity. The results showed a significant ($p < .01$) gender × ethnicity interaction; Caucasian females are more internal in LOC orientation than Caucasian males, whereas among students of Asian descent, males are more internal than are females. Follow-up ANOVAs indicated that these differences are accounted for primarily by the I+ variable. A significant ($p < .05$) tendency was also noted for Caucasian students to score higher on I+ and lower on I− variables than Asian-descended students.
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Dedication

This thesis is dedicated to Mr. Thomas Grant, Associate Superintendent of Schools, Vancouver, who has encouraged and supported me in my graduate work, and who has greatly aided the cause of education of gifted students in the Vancouver School District.
Chapter One: Overview of the study

Statement of the problem

A considerable number of research studies, not to mention hundreds of books in the popular press, have devoted themselves to the question of why one student may do well in school while another, who is equally capable according to standard measures of aptitude, does not. It has long been recognized that affective and attitudinal factors play an important role in determining a child’s school achievement; similarly, parents and teachers have been aware of the role that the awareness of outcome or consequence plays in determining a child’s behaviour.

Julian B. Rotter, in 1954, introduced the construct of locus of control to describe an individual’s perception of this relationship between behaviour and outcome. He operationalized this perception in terms of the source of control:

Internal versus external control refers to the degree to which persons expect that ... an outcome of their behavior is contingent on their own behavior versus the degree to which persons expect that the ... outcome is a function of chance, luck, or fate, is under the control of powerful others, or is simply unpredictable. (Rotter, 1990, p. 489)
A student who perceives a causal relationship between his or her own behaviour (for example, studying before a test, or persistent efforts to complete an assignment in the face of difficulties) and the reward (for example, a good mark on the test or a commendatory comment from the teacher on the assignment) is said to have an internal locus of control. Such a student is likely to perform behaviours in future tasks that will increase the likelihood of further academic rewards. On the other hand, a student with an external locus of control sees successful achievement as contingent upon factors that are out of his control, such as task difficulty or the teacher's mood. This student is much less likely to exert considerable time and effort into preparing for tests and assignments, believing that his or her own input is less important than other factors in determining his success or failure on school-related tasks.

Much empirical work has focused on the relationship between internal locus of control and academic achievement in children, the preponderance of it suggesting the existence of a significant positive correlation between the two variables (cf. the discussion in the following chapter of Bar-Tal and Bar-Zohar's 1977 review of studies, which found 31 of 36 studies reporting a positive correlation between school success and internal locus of control). The majority of research attempting to measure the construct in North American gifted students
has concluded that highly talented adolescents possess a more internal locus of control than their non-gifted agemates.

Studies investigating the effect of gender upon locus of control have not arrived at any definitive conclusions on the issue. The bulk of the research reported to date has not revealed a significant effect of gender upon locus of control (Buriel, 1981; Collier, Jacobson, & Stahl, 1987; Karnes & McGinnis, 1995; Laffoon, Jenkins-Friedman, & Tollefson, 1989; McClelland, Yewchuk, & Mulcahy, 1991; Morrow, 1989; Tidwell, 1980; Yong, 1994), although most of those studies that have found differences between genders report females to be more internally oriented than males (see, for example, Karnes & D’ilio, 1991; McLaughlin & Saccuzzo, 1997). This difference is in accord with the findings of Crandall, Katkovsky, and Crandall (1965), the authors of the Intellectual Achievement Responsibility Questionnaire, who reported that females are significantly more internal than males at all grade levels from Grade 6 upward, especially in taking responsibility for negative outcomes. Their research, however, did not specifically target a gifted population, and it would be of interest to investigate whether a similar trend holds among that group.

Research investigating correlations between locus of control and ethnicity has been similarly inconclusive. A number of early studies indicated a tendency for minority groups to be more externally oriented than middle-class white
Americans; more recent research that has controlled for the potentially confounding influence of socio-economic status has shown far less support for the conclusion that locus of control differs between ethnic groups. The bulk of the research into locus of control, however, has been carried out in the context of a Western, primarily Anglo-Saxon, cultural milieu, and the possibility that there are significant cultural determinants to locus of control cannot be ruled out. Qualified support for this possibility is provided by a study carried out by Markstrom-Adams and Adams (1995), which found that significant ethnicity-by-gender interactions existed between American Indians and white Americans.

In looking at the research into locus of control briefly summarized above, the question arises: Are there significant differences in control orientation between gifted adolescents of different ethnic backgrounds? Very little research, to this point, has attempted to answer this question. Yong, in her 1994 study comparing gifted Chinese-American, Mexican-American, and African-American middle-school students, found no significant differences; McLaughlin and Saccuzzo (1997), however, found locus of control differences between gifted middle-school students of Hispanic-American, Caucasian, African-American, and Filipino-American descents. Both of these studies were conducted in large American metropolitan areas; however, Yong’s study did not include Caucasian students, whom McLaughlin and Saccuzzo found to be the most internal of all
ethnicities studied. The inclusion by Yong of a sample of Caucasian students might have increased the likelihood of a statistically significant between-group difference in locus of control levels being found.

Summary of the problem
Research over the past forty years, since the construct of locus of control was first introduced, has generally shown a strong positive correlation between an adolescent's internal locus of control and his or her achievement in school. A positive relationship has also been indicated between internal locus of control and giftedness. The correlations between gender and locus of control and between ethnicity and locus of control are far less clear. This investigation will address the problem:

In an academic setting, what relationship exists between ethnicity and locus of control among gifted Grade 8 students? Is this relationship, if any, consistent across gender, and do gender-by-ethnicity interactions exist?

Organization of the study
Chapter One presents an overview of the rationale for the study, and provides a brief description of the research problem. Chapter Two contains a critical review
and synthesis of the relevant research in the field of locus of control, and Chapter Three details the methodology of the study. Chapter Four presents the results of the analysis of the data, and Chapter Five discusses the results of the study and outlines the implications of those results, as well as suggesting directions for further research.

Summary of Chapter One

On the basis of research into locus of control over the past forty years, it is generally accepted that a strong correlation exists between an adolescent's control orientation and his or her achievement in school, and that gifted children manifest a more internal locus of control than do non-gifted children of equivalent ages. It is less clear, however, whether a gifted student's ethnicity affects his or her locus of control, or whether gifted males or females possess a more internal control orientation. A study investigating locus of control in gifted Grade 8 students of different ethnicities is justified on the basis that the little research that has been done in this area has yielded inconclusive results. It is hoped that the proposed study will make a modest contribution to filling a gap in this field of knowledge.
Chapter Two: Review of the literature

Introduction

Chapter Two opens with a brief overview of the history of the locus of control construct, followed by a consideration of its nature. The remainder of the chapter is devoted to a discussion of research investigating the effects upon locus of control of giftedness, gender, and ethnicity. Two pieces of research which bear directly upon the subject of the present study follow, and the chapter concludes with a formal statement of research questions.

Weiner et al. (1971) attempted to clarify the factors involved in students' causal attributions in their model of attribution processes, which comprised ability, effort, task difficulty, and luck. In a later and more complex model, Weiner (1980) suggested that attributions fall along three dimensions: locus of causality (internal/external), stability (stable/unstable), and controllability (controllable/uncontrollable). The first of these three dimensions, which is cognate with the more widely used term "locus of control," has been extensively investigated in terms of its relation to students' academic achievement.

Social learning theory describes the dimension of locus of control as the perceived link between a person's actions and the outcome of those actions. Rotter (1966) observed:
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 the forces surrounding him. When the event is interpreted in this way by an individual, we have labeled this a belief in external control. (p. 1)

A person who manifests an internal locus of control sees a reinforcement as contingent upon his or her own behaviour or relatively permanent characteristics. In other words, individuals with an internal locus of control tend to believe they are in charge of their own destinies, while those with an external locus of control more often feel that events “just happen to them.”

The locus of control construct has attracted a great deal of attention since it was introduced by Julian Rotter in the mid-1950s. Herbert Lefcourt’s 1966 Psychological Bulletin article reviewing locus of control studies ranks among the top ten most frequently cited articles in the journal’s history (Lefcourt, 1992), and Rotter’s 1966 monograph describing the development of his I–E (Internal–External) scale became “the most cited article in the published social science literature of 1969 to 1977” (Strickland, 1989, p. 3).
It has long been suspected that locus of control is multidimensional, rather than a unitary construct. Two factors are identified in one of the first locus of control measures, the Intellectual Achievement Responsibility Questionnaire (Crandall, Katkovsky, & Crandall, 1965), which is still in wide use today. One of its two subscales yields a variable ($I^+$) measuring positive locus of control, and the other a negative locus of control variable ($I^-$). In more recent years, the internal structure of the construct has been subjected to factorial or principal-components analysis in a number of studies. Several researchers have reported the existence of a number of factors. Raine, Roger, and Venables (1982) extracted five factors from their locus of control scores in their study correlating locus of control with antisocial activity; Gurin, Gurin, Lao, and Beattie (1969), investigating motivation in young African-Americans, found four factors underlying locus of control; and Collier, Jacobson, and Stahl (1987) identified five factors that compose locus of control in a study that compared results from three widely used locus of control scales. These results lend support to the notion that locus of control is a multidimensional trait, although the number of dimensions varies among published studies, possibly as a result of different instruments being used to collect data.

The locus of control construct has been related to factors as diverse as reaction to disabilities (Center & Ward, 1986), rural-urban residence (Morrow,
1989), and drinking behaviour (reviewed in Lefcourt, 1983). Locus of control has also become a useful addition to the repertoire of researchers investigating academic achievement in pre-adolescents and adolescents (Crandall, Katkovsky, & Preston, 1962; Nowicki & Roundtree, 1971). Among a general school population, locus of control has been found to bear a definite correlation with scholastic achievement. Bar-Tal and Bar-Zohar (as cited in McClelland, Yewchuk, & Mulcahy, 1991), in their 1977 review of 36 studies into the relationship between locus of control and academic achievement, found 31 studies that reported a positive correlation between the two variables, three studies that reported no significant correlation, and only two studies that reported a negative correlation. These results are, perhaps, intuitively obvious; a student who sees achievement outcomes as being connected to internal attributes, such as effort, is more likely to exert the effort required to do well in the classroom than one who believes that his or her success is dependent on external factors such as luck or the teacher's mood or skill. Internal individuals tend to be more self-motivated, and are more interested in learning situations that give them a chance to choose, explore, and manipulate factors in their environment (Brooks & Hounshell, 1975; Nowicki & Strickland, 1973):

The importance of locus of control as a factor in success in a school environment has been recognized by educational researchers, who have given the
construct a great deal of attention in recent years. The 1966 release of *Equality of Educational Opportunity*, the report of a U. S. federally funded study, spurred interest in the construct when it concluded that locus of control was the primary factor in both African-American and white children's scholastic achievement, exceeding in importance the influence of schools, teachers, and families (Coleman et al., as cited in Laffoon, Jenkins-Friedman, & Tollefson, 1989).

**Locus of control in gifted children**

Characteristics often attributed to individuals with an internal locus of control orientation include being aware of their environment, pro-active in modifying their environment, and resistant to acquiesce to conformity (McLaughlin & Saccuzzo, 1997; Rotter, 1966). Other researchers have described internals as being more perceptive, inquisitive, and efficient at processing information than individuals with an external locus of control (Lefcourt, 1966). Nowicki and Strickland (1973), the developers of a widely used measure of locus of control, associated internality with “academic competence ... social maturity, and ... independent, striving, self-motivated behavior” (pp. 153–154).

A number of the same terms are to be found in literature describing the attributes of gifted learners, who are often seen as having “greater task commitment, ... more persistence, and as being more likely to take risks” than
their non-gifted peers (Collier, Jacobson, & Stahl, 1987, p. 196), characteristics that also typify individuals with an internal locus of control. The number of points of congruence between the traits exemplified by gifted individuals and those associated with internal locus of control suggests that gifted learners might well possess a more internal locus of control than do the non-gifted. This has been the subject of a considerable body of research.

The preponderance of research investigating the relationship between giftedness and locus of control in pre-adolescents and adolescents suggests that gifted learners do indeed score significantly more internal on measures of locus of control than do non-gifted individuals (Finchman & Barling, 1978; Karnes & McGinnis, 1995; Milgram & Milgram, 1975). Delisle and Renzulli (1982) reported that the IARQ, a measure of locus of control, significantly discriminated between gifted and non-gifted students. Similarly, Martorell (1992) found internal locus of control to be among the distinguishing factors in identifying giftedness in Hispanic-American students.

Noting the tendency for gifted students to show more internality than do those who are not gifted, a number of researchers have suggested using locus of control as a non-traditional selection or screening method to identify possible candidates for gifted programs in schools (Harty, Adkins, & Hungate, 1984; McLaughlin & Saccuzzo, 1997). Collier, Jacobson, and Stahl (1987) have
proposed the development of a Bayes-type prediction model, wherein each of a number of characteristics are assigned a weight based on the probability of a gifted child's possessing that characteristic, for more accurate identification of gifted students (a similar prediction model has already been developed to screen children for learning-disability programs). These researchers suggest that locus of control be included as one of the several measures incorporated into such a prediction model for identifying giftedness.

In contrast with these results associating internality with giftedness, however, are those reported by some researchers who have found no significant differences in internal locus of control levels between gifted and non-gifted groups. Davis and Connell, in a 1985 study examining the effects of aptitude (gifted versus non-gifted) and achievement (underachievers versus achievers) on self-esteem in upper elementary-aged students, found that while achievement groups differed significantly in locus of control, aptitude groups did not. Kwan (1992), investigating the psychosocial adjustment of extremely gifted secondary school students (the top 0.5% of the student cohort) in Singapore, reported that although gifted males were significantly more internally oriented than their non-gifted agemates, gifted females were more external. It is possible that differences between the cultural milieus prevailing in Singapore and North America, where most of the research into locus of control has taken place, may explain these
results; still, they introduce a discordant note into the notion that all gifted children are internally oriented.

Undoubtedly a considerable part of the inconsistency of results correlating locus of control with giftedness in children can be explained by the presence of confounding variables, such as age, sex, culture, or instruments used to measure locus of control. However, some portion of the discrepancy in results may arise from the multiplicity of definitions of giftedness and identification processes used to label children as “gifted”. It is likely that researchers investigating the link between intellectual aptitude and locus of control are in fact examining different populations.

Many school jurisdictions base identification of gifted students solely or primarily upon the results of cognitive testing using such standardized instruments as the Lorge-Thorndike or the WISC-III. In these districts, whether or not a child is admitted into a gifted programs relies heavily upon his or her IQ score. Many others, however, factor performance criteria into their selection process, and base identification of giftedness upon a child’s achievement alone or upon some combination of achievement and standardized aptitude test scores. The distinction between aptitude-based and achievement-based identification becomes important when one considers the consensus of research into relationships between locus of control and IQ, on the one hand, and between
locus of control and achievement, on the other. Most studies have found a strong link between locus of control and achievement, while few have reported significant correlations between locus of control and IQ.

A considerable amount of research has investigated the relationship between academic achievement and locus of control. The Bar-Tal and Bar-Zohar review summarizing locus of control-achievement correlation studies, which found significant positive correlations in 31 of 36 studies, has been mentioned earlier, and Collier, Jacobson, and Stahl, in their 1987 comparison of locus of control measures, discussed the usefulness of internality as a predictor of scholastic success. Harty, Adkins, and Hungate (1984) found that the highest-achieving of three groups of elementary school students studied exhibited significantly greater internality than did the others. A study exploring personality type, learning-style factors, and locus of control among gifted middle-school students determined that, of the three factors, internal locus of control was the most significantly related to achievement (Jackson, 1989), and Nowicki and Strickland (1973) found locus of control to relate strongly to achievement in students from Grades 3 to 10, especially in male students. A study of gifted college students in Alabama, however, showed no significant correlation between locus of control and students' GPAs, although locus of control was used as one factor (along with motivation and knowledge of study skills) in a multiple-
regression model that successfully predicted GPA for the group sampled (Snodgrass, 1990).

On the other hand, the data presented in the published research relating locus of control to academic aptitude, as opposed to achievement, are less conclusive. McLaughlin and Saccuzzo (1997) and McClelland, Yewchuk, and Mulcahy (1991) both found a positive correlation between internal locus of control and giftedness. Collier, Jacobson, and Stahl (1987) reviewed the research-oriented literature that attempts to relate IQ and locus of control; while they found three articles (Bialer, 1961; Powell & Centa, 1972; Stephens, 1971) that suggest the existence of statistically significant correlations, they cited four (Hersch & Scheibe, 1967; Kiehlbauch, 1968; Nowicki & Roundtree, 1971; Tolman & Bishop, 1978) that reported no significant relationship between IQ and locus of control. Collier et al. concluded that the IQ–locus of control relationship is likely a function of age, sex, or the instrument used to measure locus of control. Stephen Nowicki and Bonnie Strickland, the authors of one of the most widely used locus of control scales, asserted that no discernable correlation between locus of control and IQ manifested itself in their research (Nowicki & Strickland, 1973).

The previously noted lack of unanimity in results correlating giftedness and internal locus of control may be explainable, at least partially, in the light of the
differing links between locus of control and achievement, which seem well-confirmed, and those relating locus of control to intellectual aptitude, which are inconclusive at best. The identification processes used to label gifted children vary widely from one jurisdiction to the next. A “gifted” sample drawn from a school district that bases its identification mainly on IQ scores might not possess locus of control scores that differed significantly from their non-gifted agemates, while a sample of “gifted” children from a district that identified highly talented students on the basis of achievement as well as aptitude scores might well show significantly higher internality than a non-gifted sample from the same district.

Gender differences in locus of control

Among children of school age, does a difference exist between boys and girls in their levels of internal locus of control? Rotter (1966) observed that I–E scores when used as predictors appeared to differentiate between males and females; for example, he found internal orientation to be related to academic achievement for boys but not for girls. (This differential predictive pattern has also been noted by Nowicki and Strickland [1973], who found correlations between achievement and internality for males, but not for females.) However, most work in the field prior to 1980 either did not analyze the patterns of response in the data by sex (e.g. Collins, 1974; Gurin, Gurin, Lao, & Beattie, 1969; Reid & Ware, 1974),
or found little or no difference between male and female responses (e.g. Abrahamson, Schuldermann, & Schuldermann; Joe & Jahn; Mirels; as cited in Strickland & Haley, 1980).

The majority of research into children's locus of control published since 1980 has examined gender differences. Of these studies, most have noted no statistically significant differences in locus of control between genders at either the elementary school or the high school levels; this is true of both gifted and non-gifted samples (see, for example, Buriel, 1981; Collier, Jacobson, & Stahl, 1987; Karnes & McGinnis, 1995; Laffoon, Jenkins-Friedman, & Tollefson, 1989; McClelland, Yewchuk, & Mulcahy, 1991; Morrow, 1989; Tidwell, 1980; Yong, 1994). A study of Grade 9 students in Ontario reported similar results, although finding that females were more likely than males to take responsibility for success (Crandall's I+ variable) and less likely to accept responsibility for failure (Ross & Taylor, n.d.).

Some researchers, however, have noted significant differences in overall locus of control orientations between boys and girls. Karnes and D'Ilio (1991) and McLaughlin and Saccuzzo (1997) reported on students in the middle-school grades; both studies found females to be higher in internality than males.

Markstrom-Adams and Adams (1995), in their investigation of locus of control in high school students of varying ethnicities, found that a complex
pattern of locus of control relationships existed. While, in general, males had a more internal locus of control than did females, there were significant ethnicity-by-gender interactions. Among white Americans, girls were more internal than boys; the converse was true for Mexican-American students; for African-Americans, no significant difference existed between the genders; and among American Indians, boys were more internal than any other group in the study, while girls were more external than any other group. There is a strong suggestion here that cultural differences in upbringing may play an important role in shaping male and female children’s control orientations.

In their 1980 study examining response patterns of male and female college students on the Rotter I–E scale, Strickland and Haley found some interesting differences that may cast some light on the discrepancies in the results reported above. The male and female students had significantly different I–E means, with the males being more internal. When males and females were matched on total I–E scores and their responses compared, however, the pattern that emerged revealed that male and female responses differed significantly on 8 of the 23 items of the Rotter scale. Principal-components analysis yielded three factors for male respondents and two for females. The first factor comprised the same items for males and females; the second, however, was represented by entirely different items for the two genders, in spite of similar content of items.
Strickland and Haley concluded that the differential response patterns between males and females, even after male and female respondents were matched upon total I–E scores, indicated that internality for females cannot be equated with male internality. Internal locus of control for males appears to be related to influence over others (items dealing with personal influence and leadership), while an internal orientation for females is more likely to be related to self-direction (items having to do with planning ahead and personal destiny). The authors voice the suspicion that these sex differences are not unique to the Rotter scale but may be inherent in other locus of control instruments. These differential response patterns may explain at least some of the discrepant findings of the studies cited above. Even when scores are comparable, as Strickland and Haley note, “groups may achieve similar scores for different reasons” (p. 938).

**Ethnicity and locus of control**

Almost from the inception of the first locus of control measures, researchers have shown interest in whether the construct represents a characteristic that differentiates between various ethnic groups. A recent search of the PsycINFO database using the descriptors ‘locus of control’ and ‘ethnic?’ turned up no fewer than 145 articles. A number of studies conducted in the 1960s and ’70s, including research by some of the pioneers in the field (see, for example,
Lefcourt, 1966; Rotter, 1966) reported an expectancy of external control among minority groups, and suggested that “minority group ... members are less likely to ... aspire [to] continued education and subsequent vocational success” (Bender & Ruiz, 1974, p. 51). One of the first large-scale studies comparing African-American and white American youths, that of Gurin, Gurin, Lao, and Beattie (1969), found the African-Americans to be more external, but concluded that for many blacks in a white-dominated environment, possession of an external orientation was not maladaptive, but rather quite realistic: “An internal response reflecting acceptance of blame for one's failures, which might be considered ‘normal’ in the typical middle-class experience, may be extreme and intrapunitive for a Negro youngster growing up in poverty in the ghetto” (p. 32).

Cultures differ in their values; they esteem different personal and social priorities, and possess different means of dealing with the world outside the self. The society of the North American middle-class majority traditionally values such personal traits as independence, competitiveness, individuality, and assertiveness, characteristics which typify individuals with an internal locus of control. Many other cultures, on the other hand, try to impress upon their youngsters the primary importance of self-effacement, of co-operation, of subordinating one's own desires to the needs of the group to which one belongs (see Markstrom-Adams & Adams, 1995, p. 412, for a discussion of differing socialization
patterns of cultural groups. In terms of gender-role beliefs, too, differences exist between ethnic groups. White parents of gifted children, as compared to Asian parents, tend to exert less pressure on their daughters, expecting less productivity of them and steering them away from difficult technical fields (Campbell, Connolly, Lacattiva, & Pizzo, as cited in Robinson & Noble, 1991); this parental influence may affect a child's developing control orientation.

However, over the past twenty years or so, awareness has grown of the role that socio-economic status plays in ethnic differences in locus of control. Almost without exception, researchers have found a positive correlation between SES and internal locus of control (e.g. Bender & Ruiz, 1974; Ludwigsen & Rollins, as cited in Nowicki & Strickland, 1973). In a study relating Anglo- and Mexican-American children's locus of control to their parents' and teachers' socialization practices, Buriel (1981) reported that those studies that had found greater externality in Mexican-Americans as compared to Anglo-Americans had not taken into account socio-economic status. Studies that had controlled for SES found either no difference in locus of control between the two groups, or slightly more internality in Mexican-Americans. Similar conclusions have been reached by Bender and Ruiz (1974), comparing Mexican-Americans' and Anglo-Americans' control orientations, and by Markstrom-Adams and Adams (1995), in a study
comparing locus of control among African-Americans, American Indians, Mexican-Americans, and white Americans.

It would appear that, at least in a North American milieu, socio-economic class membership is more significant than is ethnic group membership in terms of locus of control. Caution must be exercised, however, in generalizing to other cultures; an Israeli study that investigated locus of control differences between Grade 9 students of “western” (European, American, or Israeli) descent and those of “eastern” (African or Asian) descent found a statistically significant difference, “western” students being more internal, even after removing the effect exerted by SES (Bar-Tal, Kfir, Bar-Zohar, & Chen, 1980).

An ambitious recent study (Sastry & Ross, 1998) investigating the sense of personal control in adult members of four Asian cultures (Indian, South Korean, Chinese, and Japanese) bears out the results obtained by Bar-Tal et al. The researchers found inhabitants of those four countries to have significantly lower levels of perceived control than did residents of the other 29 countries sampled, most of whose inhabitants were of European descent.

Locus of control in gifted students of different ethnicity

Little research has been carried out to date on the control orientations of gifted students of different ethnic backgrounds. The results of the studies examined
previously suggest that gifted students would likely be more internal than non-gifted students of the same age; that, overall, differences in locus of control between male and female students would be minimal; and that locus of control differences between ethnic groups may or may not exist, with any differences found being lessened or disappearing altogether when the effects of socio-economic status were accounted for.

Yong's 1994 study of gifted middle-school students largely bears out these predictions. The author investigated the relationship between self-concept, locus of control, and machiavellianism (the tendency to use guile and manipulation in social interactions) in students of three ethnic groups: African-Americans (n = 90), Mexican-Americans (n = 35), and Chinese-Americans (n = 44). Her findings were that internal locus of control correlated significantly with positive self-concept \((r = .32, p < .0001)\) and low machiavellianism levels \((r = .23, p < .05)\), and she noted no significant gender or ethnic group differences in locus of control scores. The design of the study did not include a control group of white American students, however; such an inclusion might have provided a useful point of comparison.

In contrast, the results of a 1997 study conducted by McLaughlin and Saccuzzo differ in several respects from the findings of much of the previously published research. This study examined gender and ethnic differences in locus of
control of gifted and non-gifted middle-school children, with specific reference to vulnerability factors (external variables, such as low socio-economic status, lack of fluency in English, health factors, and child abuse, that place a child at risk). The children came from Latino-Hispanic ($n = 190$), Caucasian ($n = 341$), African-American ($n = 155$), and Filipino ($n = 119$) ethnic backgrounds.

McLaughlin and Saccuzzo found, as expected, that gifted children have a more internal control orientation than did non-gifted children ($p < .005$). However, they noted a significant gender effect, with females showing a slightly but statistically significantly greater ($p < .05$) internal locus of control.

In addition, the data revealed significant ($p < .001$) differences between ethnic groups. Caucasian children were more internal than Filipino children, who were in turn more internally oriented than either the Latino/Hispanic or the African-American groups. Previous studies have shown that inter-ethnic locus of control differences were attenuated when SES was taken into account. This study did not attempt to control for socio-economic status; however, economic vulnerability is one of the vulnerability factors that were considered as possible influences upon locus of control (unfortunately, only the number of vulnerability factors, not the nature of those factors, was analyzed).

Interestingly, when the effect of vulnerability factors upon locus of control was analyzed, a strong ethnic $\times$ vulnerability interaction emerged. Although
Caucasian children became more external as level of vulnerability increased, for non-Caucasians, the reverse prevailed: increased vulnerability was associated with increased internality. This trend was more pronounced for gifted children.

The authors of the study speculate that cultural values might have a strong influence on the control orientation a child develops. They cite a 1969 study by Hsieh, Shybut, and Lotsof that found differences in locus of control between three groups of high-school students: Anglo-American, American-born Chinese, and Hong Kong-born Chinese, with Anglo-American students most internally oriented and Hong Kong-born Chinese students most external. These differences suggest the role of cultural context in development of a child’s locus of control. Few studies examining locus of control in various ethnic groups have looked specifically at the effects upon a child’s control orientation of growing up in a country in which the prevailing culture is not the same as that of the child’s family. The development of a control orientation is likely shaped by a number of environmental influences, and it is plausible that the cultural values a child absorbs through watching television or going to school might well either reinforce or weaken those taught by the child’s parents.
Summary of Chapter Two

Locus of control, a psychological trait which has its foundations in Julian Rotter's social learning theory and Bernard Weiner's attribution theory, is a bipolar attribute; individuals with an internal locus of control see reinforcement as contingent upon their own behaviour or permanent characteristics, whereas those with an external locus of control see reinforcement as the result of luck, chance, or powerful others. Much evidence suggests that the construct is multidimensional.

Locus of control has been the subject of many studies which have attempted to correlate the construct with the possession of other psychological traits. A considerable body of research suggests a strong link between internal locus of control and academic achievement.

A number of studies have found that locus of control discriminates significantly between gifted and non-gifted students, a connection which has led some investigators to suggest that the construct shows promise as one component of a non-traditional approach to identifying giftedness. Some studies, however, have not reported gifted students to be more internally oriented than non-gifted students.

The correlation between locus of control and academic achievement seems considerably better grounded than that between locus of control and academic
aptitude. Studies attempting to connect locus of control and IQ have reported mixed results.

Similarly inconclusive results have been noted in the literature investigating the effect of gender on locus of control. Most studies have found no significant gender effect in locus of control scores of children of school age; of those that have found gender differences, the majority report females to be more internal than males. One possible explanation for the disparity in findings is that internality in females does not, in fact, appear to be an identical construct to internality in males.

Considerable interest has been shown in studying whether locus of control differs between ethnic groups. Much early research in the field concluded that minority groups showed a more external orientation than did middle-class white Americans; cultural differences in children's upbringing were thought to explain this externality. A strong positive correlation has been noted between SES and internal locus of control, however, and more recent studies have indicated that once the effects of socio-economic status are controlled for, ethnic differences in locus of control are diminished, or, in some cases, eliminated.

Few studies have examined the relationship of ethnicity and locus of control among gifted students. A study by Yong (1994), involving Chinese-American, Mexican-American, and African-American middle-school students who were
gifted, showed no significant ethnic differences in locus of control. On the other hand, McLaughlin and Saccuzzo (1997), in a study comparing gifted Hispanic-American, Caucasian, African-American, and Filipino-American middle-school students, found a significant effect for ethnicity in locus of control level, Caucasian students being most internal and African-American and Hispanic-American students most external.

**Formal statement of research questions**

The research questions to be addressed in the present study are

- Do gender differences in internality exist among gifted Grade 8 students?

- Does a significant difference in control orientations, relative to academic achievement, exist between gifted Grade 8 students of Asian and European descent? In other words, do students of one ethnicity possess a more internal locus of control than students of the other?

- Are there any significant gender × ethnicity interactions in locus of control among gifted Grade 8 students?

As has been noted previously, no consensus has made itself apparent in the limited research that has been performed investigating locus of control of gifted adolescent students of various ethnicities; thus the present study is exploratory in nature. Consequently, no formal hypotheses have been stated.
In Chapter Three, a description of the methods used to investigate the research questions is provided.
Chapter Three: Methodology

Introduction

Chapter Three of this study describes the participants in the study and the measure used to assess their internal locus of control levels, and summarizes the procedure used to obtain and analyze these data.

Participants

The participants in this study were 67 students, ranging in age from 12 years 7 months to 14 years 8 months (median age = 13 years 11 months), who were enrolled in mini-school programs for highly talented students in three Vancouver secondary schools. After making contact by letter with the teachers and administrators of the participants in order to describe the proposed study and to obtain their co-operation, the researcher explained the study to the participating classes and sent letters to the students’ parents, describing the research and assuring them of anonymity and confidentiality. Consent forms to be signed by the students’ parents accompanied the letters.

The students whose data were used in the study are of Asian and European descent (see Table 1, following). To simplify administration of the locus of control measure, all students in mini-school classes of the appropriate grade level
(Grade 8) were tested; however, the data from those students who did not meet the inclusion criteria for ethnicity were not used.

| Table 1 |
|-----------------|-----------------|-----------------|
| **Distribution of Participants by Ethnicity and Gender** | **Asian** | **European** | **Total** |
| Female | 26 | 11 | 37 |
| Male | 15 | 15 | 30 |
| Total | 41 | 26 | 67 |

The participants in the study were students enrolled in special programs for highly-able students in three Vancouver secondary schools. The socio-economic levels of the communities from which these schools draw most of their students range from lower-middle to upper-middle class; however, these programs attract significant cross-boundary transfer students, and in effect draw students from across the entire city. The selection criteria used for acceptance of students into these programs for the highly able vary somewhat from school to school, and it is thus difficult to assume that sample characteristics (e.g. aptitude test scores) will necessarily be equivalent from the three sites. However, teacher descriptions of the special-program students indicate a good deal of commonality among the three programs; phrases such as “very bright”, “highly motivated”, “creative”, and “talented” are used by teachers from all three programs.
Design

The study used a factorial design, with two independent variables: gender and ethnicity. The ethnicity variable has two levels, reflecting the ethnic extraction of the participants: Asian and European. Participants were assigned to groups according to their mothers’ and fathers’ ethnicity. The dependent variables, $I$ (overall internal locus of control), $I^+$ (positive internal locus of control), and $I^-$ (negative internal locus of control), are continuous variables, which were measured by the Intellectual Achievement Responsibility Questionnaire (Crandall, Katkovsky, & Crandall, 1965).

Setting

The questionnaire was administered in the students’ regular classrooms in the schools during scheduled class hours. No special apparatus was required.

Independent variables

Two independent variables, ethnicity and gender, were used as factors in this study. Ethnicity was determined by asking participants to state their fathers’ and mothers’ ethnic backgrounds. Students who reported both parents’ ethnic backgrounds as “Asian” or who specified an Asian country or nationality were
classified as of Asian descent; similarly, those students who stated that both parents were from "European" backgrounds, or who specified a European or Israeli nationality or country, were classified as of European descent. To minimize possible confounds arising from a participant being of mixed ethnic descent, data were used only for those students whose parents both belong to the same ethnicity category (European or Asian).

**Measure of internal locus of control**

The scale used to derive internal locus of control scores for the participants was the Intellectual Achievement Responsibility Questionnaire (Crandall, Katkovsky, & Crandall, 1965; see Appendix), which yields three scores: $I+$ (positive internal locus of control—the attribution of successes to one's own efforts), $I-$ (negative internal locus of control—the attribution of failures to one's own efforts), and $I$, an overall internal locus of control score.

The IAR measure, since its creation, has been widely used to study locus of control in both gifted and non-gifted students from Grade 3 upwards. Other locus of control scales have also seen broad acceptance, for example the I–E Scale (Rotter, 1966), the Bialer-Cromwell Children's Locus of Control Scale (Bialer, 1961), and the Nowicki-Strickland Locus of Control Scale for Children (Nowicki & Strickland, 1973). The IAR was chosen for use in the present
investigation, however, because it yields scores for both positive and negative components of locus of control, and because of its specific focus upon achievement in an academic setting, in contrast to the other measures, which provide generalized locus of control scores.

The IAR scale comprises 34 forced-choice items, each constructed with a stem that briefly describes a positive or negative achievement experience that occurs commonly in a child's life. Two options are provided for each item: one states that the event was a result of the child's action or innate ability, while the other attributes the event to a person who is most likely to affect a child's life: a parent, teacher, or peer.

Seventeen items deal with positive events in a child's life, and 17 with negative events. The participant's $I^+$ score is calculated by summing the positive events for which he/she takes credit, and the $I^-$ by totalling the negative events for which he/she assumes responsibility. The total $I$ score is the sum of the $I^+$ and $I^-$ scores. The highest possible value of $I$, 34, would indicate a subject with a highly internal locus of control, while the lowest possible value, 0, would signify a very external locus of control.

Test-retest reliability of the scale is reported by the authors as moderately high: correlations of between .66 and .74 were found over a two-month span (for children in Grades 3, 4, and 5; older students were not retested). Split-half
reliabilities were computed to derive internal consistency data for each of the two subscales ($I^+$ and $I^-$), and ranged from .54 to .60. No data on the instrument's validity are reported by the authors. Collier, Jacobson, and Stahl (1987) computed inter-measure reliabilities between the IAR and two other commonly used measures of locus of control, the Nowicki-Strickland Locus of Control Scale for Children and the Bialer-Cromwell Locus of Control Scale for Children, and found significant but moderate correlations ($r = .40$ and $.34$, respectively; the $r$s rise to $.59$ and $.54$, respectively, after disattenuation). The normative sample comprised 923 participants drawn from American midwestern schools in diverse types of communities, spanning a range of socio-economic status. The students in the norm group ranged from the 3rd to the 12th grade. No information on ethnic makeup of the sample was provided, however.

The overall ($I$), positive ($I^+$) and negative ($I^-$) internal locus of control scores were used in this study. The measure was scored by hand, using custom scoring templates, and $I$, $I^+$, and $I^-$ scores computed for each participant.

Procedure

The researcher made a brief presentation to the students approximately a week before administering the measure to explain the purpose of the study and the procedures to be followed, and to allow the students the opportunity to ask
questions and clarify concerns. Consent forms were included in the explanatory package that went home to the participants’ parents, and those students who returned consent forms signed by their parents and who gave their own verbal consent were administered the IARQ by the researcher. The administration took between twenty and thirty minutes, and the researcher and the students’ classroom teacher were present throughout the procedure.

**Analysis**

The technique decided upon to analyze the effect of ethnicity upon internal locus of control in highly talented students was a two-way multivariate analysis of variance (MANOVA), followed by post-hoc univariate analyses of variance to determine the source of any significant differences. This procedure was chosen because of its ability to reveal significant differences, if any, found to exist between the means of the two groups of students (those of Asian and of European descent), and between the means of male and female students, as well as any existing interactions between the two factors.
Summary of Chapter Three

The participants in this study were 67 high-ability Grade 8 students of Asian and European ethnic origin, enrolled in mini-school programs in Vancouver secondary schools; their internal locus of control levels were measured by the Intellectual Achievement Responsibility Questionnaire, and these data were analyzed by a two-way multivariate analysis of variance, followed by univariate ANOVAs.
Chapter Four: Results

Introduction

In this chapter, the raw data obtained from the study and the results of the data analysis are presented in tabular form and described.

Data obtained from administration of the IARQ

Table 2, which follows, presents by group the means and standard deviations of the scores for $I$, $I+$, and $I-$ variables, obtained from administering the Intellectual Achievement Responsibility Questionnaire to the participants in the study.

<table>
<thead>
<tr>
<th></th>
<th>Asian Mean (M)</th>
<th>Asian SD</th>
<th>European Mean (M)</th>
<th>European SD</th>
<th>Overall Mean (M)</th>
<th>Overall SD</th>
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<tr>
<td>$I$</td>
<td>21.23</td>
<td>3.96</td>
<td>23.45</td>
<td>5.09</td>
<td>21.89</td>
<td>4.38</td>
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<tr>
<td>$I+$</td>
<td>10.54</td>
<td>2.35</td>
<td>13.45</td>
<td>2.50</td>
<td>11.41</td>
<td>2.72</td>
</tr>
<tr>
<td>$I-$</td>
<td>10.69</td>
<td>2.65</td>
<td>10.00</td>
<td>2.83</td>
<td>10.49</td>
<td>3.32</td>
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<tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$I$</td>
<td>23.33$^d$</td>
<td>4.58</td>
<td>20.87</td>
<td>5.04</td>
<td>22.10$^f$</td>
<td>4.89</td>
</tr>
<tr>
<td>Male</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>$I+$</td>
<td>11.93</td>
<td>3.06</td>
<td>11.07</td>
<td>2.55</td>
<td>11.50</td>
<td>2.80</td>
</tr>
<tr>
<td>$I-$</td>
<td>11.40</td>
<td>2.10</td>
<td>9.80</td>
<td>3.21</td>
<td>10.60</td>
<td>2.79</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$I$</td>
<td>22.00$^g$</td>
<td>4.27</td>
<td>21.96</td>
<td>5.13</td>
<td>21.99$^i$</td>
<td>4.58</td>
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<tr>
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<td></td>
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<td></td>
<td></td>
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<tr>
<td>$I+$</td>
<td>11.05</td>
<td>2.68</td>
<td>12.08</td>
<td>2.76</td>
<td>11.45</td>
<td>2.74</td>
</tr>
<tr>
<td>$I-$</td>
<td>10.95</td>
<td>2.46</td>
<td>9.88</td>
<td>3.19</td>
<td>10.54</td>
<td>2.79</td>
</tr>
</tbody>
</table>

$^a n = 26; ^b n = 11; ^c n = 37; ^d n = 15; ^e n = 15; ^f n = 30; ^g n = 41; ^h n = 26; ^i n = 67$
Analysis of data

The data collected were analyzed using *SPSS 8.0 for Windows*, using a four-step procedure. First, a correlation value between the dependent variables $I+$ and $I-$ (positive and negative internal locus of control) was computed; the third dependent variable, $I$, is derived by summing $I+$ and $I-$, and therefore was not included in the test of correlation. Second, a multivariate analysis of variance (MANOVA) was calculated, using gender and ethnicity as independent factors, and $I+$ and $I-$ as dependent variables. Third, Box's Test of Equality of Covariance Matrices was run, to ensure that matrices of covariance for all experimental groups were equivalent. Finally, post hoc univariate analyses of variance (ANOVAs) were computed, using gender and ethnicity as independent factors, and $I$, $I+$ and $I-$ as dependent variables.

$I+$ and $I-$ were found to be moderately yet significantly correlated (Pearson's $r = .372; p = .002$). This degree of correlation between the two subscales is similar to that found by the authors of the Intellectual Achievement Responsibility Questionnaire, whose norming data yield a correlation of .40 between the two variables for Grade 8 students.

A multivariate analysis of variance (MANOVA) was then performed, using gender and ethnicity as independent factors and $I+$ and $I-$ as dependent
variables, to discover whether significant differences existed between male and female students or between students of Asian and European descent. The use of MANOVA rather than a univariate analysis of variance (ANOVA) is recommended, where the dependent variables are correlated both empirically and, ideally, theoretically (Weinfurt, 1995), because it allows the researcher to "conceptualize and analyze the nature of [interrelated differences between groups]" (Borg & Gall, 1989, p. 560).

The MANOVA showed significant effects for ethnicity and for the gender \( \times \) ethnicity interactions. The MANOVA procedure assumes that matrices of covariance—the variance shared between the two variables—are equal across all experimental groups (Weinfurt, 1995). To ensure that this was the case in the present study, Box's Test of Equality of Covariance Matrices was applied to the data. This test yielded a non-significant result \( (F = .706; p = .704) \), thus indicating a satisfactory degree of homogeneity of the covariance matrices.

Follow-up univariate ANOVAs for the dependent variables \( I^+ \) and \( I^- \) were performed, as well as a univariate ANOVA on the \( I \) variable data to investigate the possible presence of differences between groups when \( I^+ \) and \( I^- \) are combined to provide a single index of locus of control.

Results of these analyses of variance are summarized in Table 3, following.
The multivariate analysis of variance yielded a significant gender × ethnicity interaction ($F = 4.187; p = .020$) for these data. Post-hoc univariate ANOVAs indicated that the $I+$ variable contributed the great majority of the inter-group variance here ($F = 8.111; p = .006$; the $I-$ value for $F$ was only $.402, p = .526$). The magnitude of the $I+$ interaction effect was such that the summary $I$ variable showed significant between-group differences ($F = 4.057; p = .048$), in spite of the considerable proportion of $I$ represented by its non-significant $I-$ component.

Inspection of group means shows Asian-descended male students to be somewhat more internal ($M = 11.93$) on the $I+$ variable than are Caucasian male students ($M = 11.07$), and considerably more so on the $I-$ variable ($M = 11.07$).
11.40 for Asian-Canadian males vs. 9.80 for Caucasian males). For female students, however, the pattern differs: $I^-$ scores for Asian-Canadian females ($M = 10.69$) are somewhat higher than those for female students of European descent ($M = 10.00$), but on the $I^+$ variable, female students of Asian descent are substantially less internal than those of European descent ($M = 10.54$ for Asian-Canadian females vs. 13.45 for Caucasian females).

These data can also be interpreted in the light of intra-ethnic gender differences. The means indicate a tendency for male students of Asian ethnicity to assume considerably greater responsibility for positive academic outcomes ($I^+: M = 11.93$) than do female Asian students ($I^+: M = 10.54$). The opposite trend, however, prevails among students of European descent, where female students show a substantially more internal positive locus of control ($I^+: M = 13.45$) than do their male counterparts ($I^+: M = 11.07$).

A significant difference between groups on the ethnicity factor emerged in multivariate testing. An examination of the descriptive statistics in Table 2 suggests that Asian-descended and European-descended students trend in different directions on the two subscales. Students of Asian ethnicity tend to have lower $I^+$ scores ($M = 11.05$) and higher $I^-$ scores ($M = 10.95$) than do students of European descent ($I^+: M = 12.08; I^-: M = 9.88$).
This analysis took advantage of MANOVA's ability to examine variables as interdependent pairs, as univariate analyses of each dependent variable taken did not reveal any significant differences between group means. The differences in group means between the two levels of ethnicity are evidently not of sufficient magnitude to assume statistical significance when either of the subscales is looked at individually; however, because the group mean differences vary in direction, when the two sets of dependent variable data are looked at together, it becomes apparent that the ethnic groups differ significantly in locus of control.

The means found for all three dependent variables ($I$: 21.99; $I+$: 11.45; $I-$: 10.54) were considerably lower than those reported by Crandall et al. for the Grade 8 students in their norming group ($I$: 26.11; $I+$: 13.19; $I-$: 12.92), and somewhat lower than those reported by other researchers using the same instrument.

**Summary of Chapter Four**

An overall multivariate analysis of variance was computed for the $I+$ and $I-$ variables, which were found to correlate to a significant degree. Follow-up univariate analyses of variance were then run for $I+$, $I-$, and $I$, in order to ascertain the sources of significant between-group differences.
No significant main effect was found for gender; however, the MANOVA showed a significant effect for ethnicity. Significant gender × ethnicity interactions were found for the $I+$ and $I$ variables, suggesting a tendency for Asian-descended male students to possess a more internal locus of control than Asian-descended female students, but for European-descended male students to be less internal than European-descended female students.
Chapter Five: Discussion of results

Introduction

Chapter Five will open with an integrative summary of the findings and a discussion of potential hypotheses. The nature of the significant gender \times\ ethnicity interaction is examined; separate discussion of main effects is superfluous in the light of the clear cross-factor differences found to exist between the four experimental groups. Implications for educators will be discussed, followed by a consideration of the limitations of the study. The chapter will close with directions for further research.

Summary of findings

The most notable finding to emerge from analysis of the study’s data was that a considerable, and statistically significant, interaction exists between gender and ethnicity, a finding that few other researchers have recorded. No main effect for gender was detected, a result that accords with the majority of published research in the field; although gender means did differ within ethnic groups, the directions of the differences were such that when students of both ethnic groups were considered together, the dissimilarities between gender means cancelled out each other. For ethnicity, similarly, no main effect was observed. Although
results from multivariate analysis of variance indicated ethnicity differences in \( I^+ \) and \( I^- \) scores, post hoc univariate ANOVAs failed to confirm these differences.

The pattern that emerged from data analysis showed that among students of European descent, females are much more likely than males to believe that outcomes of academic events in their lives are contingent upon their own actions or permanent attributes: they are much more internal in their locus of control orientations. For students of Asian ethnicity, however, the inverse is true: boys are significantly more internally oriented than are girls. Post hoc analysis indicates that it is primarily the \( I^+ \) variable that accounts for the difference; its contribution to the overall \( I \) score is of sufficient magnitude to bring the between-groups difference in \( I \) to a significant level as well.

This gender \( \times \) ethnicity interaction, while unexpected in its degree, was foreshadowed by earlier research. Markstrom-Adams and Adams (1995) found a similar interaction in their study of psychosocial functioning among high school students in a southwestern community. When Caucasian, African-American, Mexican-American, and American Indian students of both genders were compared on locus of control scores, Caucasian girls were more internal than Caucasian boys, whereas among both Mexican Americans and American Indians, boys were considerably more internal than girls.
The multivariate analysis of variance also revealed a significant difference between the two ethnic groups in the direction of the divergence of the positive and negative internal locus of control scores from the inter-ethnic means. Students of Asian origin received very similar scores on I+ and I− subscales, while Caucasian students tended to score higher on I+ and lower on I− than did those of Asian descent. These differences, however, failed to appear to a significant level in post hoc univariate analyses of variance, and thus cannot be regarded as conclusive.

Why these differences should exist is not entirely clear. The positive and negative internal locus of control subscales are related empirically, as their significant Pearson correlation indicates. They are also theoretically related. To take an example, a student who scores high on the I+ subscale is able to see the connection between considerable effort expended in preparing for a test or assignment and the eventual high letter grade that results. Logically, then, when the student does not prepare as thoroughly for another test, he or she should be able to explain a low grade on that test as the result of the lack of previous effort. Thus, in theory at least, a child’s I+ and I− scores should be similar, and both should increase with age as more opportunities to experience the connection between effort and result present themselves to the child.
This is not always the case in practice, however. Ross and Taylor (n.d.), using the Intellectual Achievement Responsibility Questionnaire, found \( I^+ \) scores to be significantly higher than \( I^- \) scores among Grade 9 students in Ontario. This effect was noted only among girls, however; boys’ \( I^+ \) and \( I^- \) scores were not significantly different. Crandall et al. (1965), in their discussion of the metrics of the Intellectual Achievement Responsibility Questionnaire, reported that while \( I^+ \) and \( I^- \) did increase slightly with age, substantial differences were found between \( I^+ \) and \( I^- \) scores for the same students. They conceded that the two subscales are relatively independent; and concluded “it would be imprudent to assume that \( I^+ \) and \( I^- \) scores are measuring the same orientation” (p. 101). In fact, their correlation of 0.40 between the two subscales for Grade 8 students suggests that only 16% of the variance in \( I^- \) can be explained by \( I^+ \).

The reason for these discrepancies between \( I^+ \) and \( I^- \) scores is not obvious. A possible clue can be found in Crandall et al.’s Table 3, which details correlations between the two subscale scores at various grade levels. In Grades 3 through 5, no significant correlations are found between the two subscales, and \( I^- \) scores generally lag behind those for \( I^+ \). Significant correlations begin to manifest themselves at the Grade 6 level, a trend that continues at least through Grade 10. (Interestingly, the researchers found that the subscale correlation dropped considerably for Grade 12 students. They attributed this anomaly to
possible anxieties over post-secondary careers and uncertainty about their ability to control future events, both likely to affect locus of control.) This convergence of $I^+$ and $I^-$ scores at higher grade levels suggests the possibility of a developmental factor: individuals may learn self-responsibility for positive and negative outcomes at different rates, with acceptance of credit for successes being acquired generally at an earlier age than assumption of blame for failures.

Whether the developmental explanation also holds true for gifted students is not clear. Little research has been done to investigate positive and negative internal locus of control in gifted populations. Certainly other considerations than age come into play, as is evident from the results found in the present study, where Asian-descended students show less divergence in $I^+$ and $I^-$ scores than do those of European descent. Cultural differences in upbringing may play a part in determining the rate at which children acquire positive and negative internal locus of control orientations.

**Locus of control in Caucasian students—a societal influence?**

Why the difference between Caucasian boys and girls in terms of locus of control? One possible explanation lies in a consideration of gender role beliefs. A growing child encounters innumerable gender role examples during his or her formative years, and over time he or she comes to the understanding of what is
expected of a male or female, of what a male or female "can" or "should" do, of what is "appropriate" behaviour for a male or female, in the context of the society in which the child is growing up.

A child's locus of control orientation develops incrementally at the same time of life and in a similar manner. As he or she moves through childhood and the adolescent years, situations arise where the child has the opportunity to assess whether the outcome, desirable or undesirable, was contingent upon his or her previous behaviour. Over time, the child begins to perceive the degree and frequency with which he or she has control over the outcome of a situation—those who feel that their behaviour often influences outcomes develop an internal locus of control (Lefcourt, 1966).

It is not difficult to see the impact that a circumscribed set of gender roles might have upon the development of a young child's locus of control orientation. An internal control orientation is fostered by seeing a link between one's actions and the consequence; when a desired outcome is seen as impossible to bring about through one's own deeds, a sense of fatalism, and ultimately a more external locus of control orientation is likely to develop.

During the 1970s and 1980s, a number of school authorities started to offer special programs, targeted specifically at female students, in response to powerful societal changes. Women were entering the labour force in such
unprecedented numbers that by the 1980s the majority of married women were working outside the home (Alfred, 1991). Even as North American society was undergoing this substantial restructuring, educational researchers were warning schools that many girls, even gifted ones, were accepting the prevailing stereotype that careers involving math and science were male domains. J. S. Eccles wrote in 1985 that gifted females do not achieve as highly as gifted males:

... They are less likely to seek out advanced educational training, and, even when they do, they do not enter the same fields as do their male peers. They are over-represented in the fields of education and literature and under-represented in science, math, and engineering .... Gifted women are less likely to have a professional career than their male peers. (cited in McCormick & Wolf, 1993, p. 85)

The intervention programs instituted by school authorities to alert female students to gender role stereotypes took various forms. The EQUALS program, in the United States, was a year-long in-service program for teachers, designed to assist in developing strategies to increase female students' math confidence and career awareness. "Expanding Your Horizons," a one-day workshop for high-school girls held annually since 1976 by the Bay Area Women in Math/Science Network, has been successful in altering female students' career-related attitudes (McCormick & Wolf, 1993).
Educational authorities in Canada were not far behind in offering programs to encourage female students to consider careers in traditionally male-dominated fields. For example, in Vancouver secondary schools, mentorship programs for girls were organized, and school clubs were set up, in co-operation with the YWCA, to explore women's issues. The B. C. Teachers' Federation sponsored conferences for female students in such professions as architecture, law, and veterinary medicine, although they held no such conferences for male students (Todd, 1999).

Such initiatives on the part of educators across Canada and the United States are likely part of the reason that female students are currently excelling in academic settings as never before. An analysis of student performance in British Columbia over the past six years shows that girls generally receive higher marks than boys in all Grade 12 subjects (Steffenhagen, 1999). British Columbia universities report that 60 per cent of students entering class are female, and women outnumber men in every undergraduate discipline in Canada except computer science. Recent American studies indicate that high-school girls are twice as likely as boys to aspire to careers in management, the professions, or business (Todd, 1999).

Young women currently enjoy unprecedented academic success and more career opportunities than ever before. These attainments are echoed by a trend
that sees increasing numbers of female students assuming leadership roles in high-school settings. Teachers at many secondary schools in Vancouver report that it is unusual now to see male students holding positions such as student council president, yearbook editor, or graduation class valedictorian; twenty years ago, these posts would routinely have been held by male students.

Educators are currently seeing in high schools a generation of successful, self-assured, confident young women who feel that they can enter any occupation they choose. It is not surprising, then, to see in a sample of highly talented young Caucasian female students an internal locus of control score that significantly exceeds that of their male counterparts. That the main difference was found in the means for the $I^+$ variable (taking credit for successes), rather than the $I^-$ (taking responsibility for failures), lends credence to this interpretation, suggesting a sense of pride in accomplishment and control over one's scholastic destiny.

It is possible, of course, that alternative explanations besides that outlined above might account for European-descended female students' more internal locus of control. Another intervening variable (for example, socio-economic status) may be mediating the locus of control variables. Whichever third variable is postulated to explain the findings, however, must be capable of gender-specific effects.
Locus of control in Asian–Canadian students: a cultural influence?

The obvious questions at this point seem to be, Why, then, do we not see a similar trend manifesting itself among students of Asian descent? What influences are at work that cause Asian-Canadian boys to have a more internal locus of control orientation than Asian-Canadian girls?

Traditionally, in many Asian cultures, male children have been more highly regarded than females, a valuation that likely had its roots in the agrarian history of most Asian countries. Although much of the population has left the farms and moved to the cities, and although government initiatives have attempted to modify sexual status (witness China’s Communist government giving women the right to inherit property and encouraging them to work outside the home), the tradition of preferential treatment of male children has resisted change. Foreigners wishing to adopt a baby from China can now do so—provided that it is a girl baby. Even the advent of modern technology has been put to use to maintain the male-favouring status quo: the use of amniocentesis to determine the gender of the fetus is often followed by an abortion if the fetus is female (Burton, 1990).

There is little doubt that when a family leaves its land of origin and settles overseas in a country whose prevailing culture is different, traditions erode. However, they do not disappear immediately; deeply rooted cultural beliefs may
survive for several generations. This is especially the case in Vancouver, where the large Asian community may serve as a buffer between Asian immigrant families and the prevailing Western culture. The convention of preferential treatment of male children in families of Asian origin is certainly still common, even in many households where the children's parents were born in Canada. The researcher can recall a number of interactions with female students of Asian descent who, in recounting incidents relating to family dynamics, have reported, quite matter-of-factly, instances where brothers, even younger ones, are given preferential treatment over themselves and their sisters. These instances include providing male children with financial support for educational choices, and assigning to the females the responsibilities of housework and caring for younger siblings.

It is not surprising that a boy growing up in a family where male children get their way more often than female children should feel a greater sense of control over the outcome of situations concerning himself. It is likely that the observation that Asian-descended male students score more internal than do Asian-descended females on the locus of control scale reflects an upbringing in which the male is more apt to see his choices for higher education and career paths supported by the family than are those of his sisters.

In attempting to explain this study's finding of more internality among Asian-descended male students than female students, once again alternative
hypotheses must be considered. There may be validity issues relating to the instrument that lead it to yield scores that suggest the existence of locus of control orientation differences that do not, in fact, exist. It is possible, for instance, that the wording of some of the questions on the Intellectual Achievement Responsibility Questionnaire “pulls” for an internal response for boys more than for girls. For example, Question 31 asks, “If your parents tell you that you are bright or clever, is it more likely because they are feeling good, or because of something you did?” A female student from a family where boys customarily receive more parental praise than girls might well choose the first (external) response, feeling that a compliment from her parents is likely to be more a product of their mood than a reaction to her own behaviour. A male student might see the situation quite differently, and opt for the internal response.

The study’s data reveal locus of control differences between same-gender students of different ethnicities. Males of Asian descent score more internal on all three dependent variables than do those of European descent; Asian-Canadian boys feel they have more control over outcomes than do Caucasian boys. A possible explanation for this difference rests in the preferential treatment, discussed previously, that many Asian-Canadian boys receive in the environment of family and society; it may be that boys of European descent do not receive the
same degree of support from their families, and they may feel that they are losing ground in society as they witness female successes both in school and in the workplace. A more external control orientation among Caucasian male students may thus be evolving.

A tendency for European-descended females to score more internal than those of Asian descent (on the $I+$ and $I$ variables, although their $I-$ scores were slightly lower) also made itself apparent in the results of the data analysis. Again, a possible interpretation lies in trends that have been discussed earlier. Caucasian female students are excelling in school contexts and are discovering a widening range of prospects in the occupational realm, thus leading to an increased sense of control over their destinies. Asian-Canadian females may feel that their options are more limited as a result of receiving less family support for post-secondary education and subsequent career choices than do their male siblings.

An unexpected finding of the study related to the overall mean scores for the three dependent variables, which were substantially lower than those published for the Grade 8 students in the norming group by Crandall et al. (1965), the authors of the IAR. Total group mean scores for $I$, $I+$, and $I-$ reported by the authors were 26.11, 13.19, and 12.92 respectively, as compared with this study's means of 21.99, 11.45, and 10.54 for the three variables. The consensus of research literature suggests that a gifted sample is likely to score
more internal than their non-gifted peers; this conclusion was not borne out by
the results of this study.

Other research also reports means for Grade 8 students that are higher than
those found in this study, although not as high as those obtained by Crandall et
al. For example, McClelland, Yewchuk, and Mulcahy (1991) report means for $I$,
$I+_1$, and $I_-$ of 24.8, 13.3, and 11.5 respectively for a Grade 8 sample of
underachieving and achieving gifted children.

The reason for the low means found by this study is not apparent. Possible
explanations include potential reliability problems with the instrument (a meta­
analysis of IAR studies conducted by Cooper, Burger, and Good, 1981, showed
a wide range in total $I$ scores, from 23.19 to 27.68, among elementary-age
students); issues in sampling, whereby the groups studied have characteristics
that are not reflective of the populations from which they are drawn; a possible
general trend toward more externality in locus of control orientations, perhaps
reflective of societal trends, in the 34 years since initial publication of the IAR; or
potential differences in national characteristics between American and Canadian
Grade 8 populations (the McClelland et al. study, 1991, which yielded lower
means than those published by Crandall et al., 1995, was conducted with a
Canadian sample).
It is also conceivable that some characteristics specific to Grade 8 mini-school students in Vancouver conduced to the lower internal locus of control means found by this study. Grade 8 is a year of passage in the Vancouver school district; the transition from a small elementary school where one is in the most senior class to a large secondary school where one is a member of the most junior class is daunting for many students and might reasonably cause a noticeable, if temporary, lessening in perceived control. If this hypothesis holds, it would apply to gifted students as well as to their non-gifted agemates.

In fact, for some of the gifted students in these mini-school programs, the step from elementary to secondary school might be even larger than for the non-gifted Grade 8 students; most of them would have come from classes in which they were at or near the top academically, and where competition and possibly teacher expectations would have been much lower than in the mini-school. These students might now, suddenly, be facing a new set of academically talented classmates, who all represent potential challengers for class eminence. It is conceivable that perceived control might waver under these circumstances.

Synopsis

Analysis of the data collected for this study suggests that among Grade 8 mini-school students, females and males do not vary significantly in internal locus of
control; nor do students of Asian and European ethnic origins. Differences appear, however, when the internal locus of control score is separated into positive and negative components.

A significant interaction between gender and ethnicity was found to exist. Among students of European ethnicity, female students possess a significantly more internal locus of control orientation than do male students, while among Asian–Canadian students, the converse holds true, with male students showing more internality than female students. It is conjectured that societal influences may play a role in the high internality of Caucasian females, and that cultural tradition may be related to the lower internality of females of Asian descent.

The study yielded lower means for $I$, $I+$, and $I−$ than previous research reported. Possible explanations include sampling from populations that might differ, because of nationality, changing societal norms, or for some other reason; and a temporary decline in levels of internal locus of control related to the students' transition from elementary to secondary school.

**Implications for educators**

Literature in the field of locus of control strongly supports the existence of a positive correlation between internal locus of control and achievement in both gifted and non-gifted student populations. The institution of special programs,
discussed earlier, for female students is likely to have contributed to the more internal locus of control found in Caucasian girls and their subsequent participation in leadership roles. Given these considerations, educators may find that initiatives aimed at increasing internal levels of locus of control in gifted students, especially among the less-internal groups identified by this study (male students of European descent and female students of Asian descent), will prove fruitful.

Initiatives aimed at European-descended male students

- Male students can be actively recruited for student conferences and such leadership roles as student government. A quota system, similar to that formerly seen in intramural sports (a minimum of two female players on each team), might be introduced.

- Teacher-librarians and library resources can be drawn upon to instigate research projects designed to replace current role models for boys (which are generally sports stars or rap musicians) with young men pursuing careers in government, professions, and new technological fields. Dynamic young local leaders in non-traditional fields might be emphasized, and perhaps called upon as guest speakers.
• Technology, in which adolescent males still exhibit a greater interest than
do their female peers, can be used to encourage male participation in
student activities such as designing and creating websites for schools.

• Career-preparation programs for secondary school students can and should
be used to encourage male students to investigate new career paths.

• Mentorship programs similar to those that have successfully enabled female
students to explore possible careers can be instituted for males as well.

Initiatives aimed at Asian-descended female students

• Those programs that already exist to promote female students' self-esteem,
self-awareness, and familiarization with non-traditional career opportunities
should continue, with additional emphasis placed on targeting
Asian-Canadian females.

• Local guest lecturers of Asian descent can be asked to visit schools, to
encourage females to explore careers in film-making (Mina Shum), writing
(Evelyn Lau); broadcasting (Susie Chan), and other occupations.

• In-service awareness programs for educators such as counsellors and career
preparation teachers should be instituted, so that these personnel can
courage female Asian-Canadian students to aspire to higher education
and traditionally male professions.
• Former graduates (of Asian descent and otherwise) can be showcased at school open houses and parent-teacher conferences, to explain to parents the educational and career possibilities that exist for both genders.

Limitations of the study

The present study was conceived as a small-scale exploration of an issue that has thus far received little attention in the literature of research: the connection between gender, ethnicity, and locus of control in a population of gifted high-school students. The researcher’s intentions were to make a modest contribution to knowledge in this field, and to encourage further exploration of this issue; however, several constraints exist that limit the generalizability of the conclusions of the study.

The overall sample size is somewhat small, the sample of Caucasian female students ($n = 11$) particularly so. The effect sizes noted, however, are substantial enough that none of the findings that achieved significance were marginal, which is often the case with research conducted on small samples.

The study examines gifted students of only a single grade level. Caution, therefore, must be exercised in drawing conclusions about students of other grades, particularly in light of the tendency for locus of control to become more
internal, and for the positive and negative components of internal locus of control to change relative to each other, with age.

Two methodological concerns also might affect the generalizability of the results. First, mini-schools for talented students at three study sites were used for data collection, and the question arises of whether the samples from each site were drawn from equivalent populations, as each secondary school sets its own criteria for mini-school admission. Second, the data analysis procedure chosen involved the computation of a multivariate analysis of variance, with follow-up univariate ANOVAs to identify the source of significant group differences. Some question exists as to whether running a series of ANOVAs is methodologically sound; the concern is that doing so raises the likelihood of a Type I error (Weinfurt, 1995). The fact, however, that the multivariate analysis revealed a significant group difference that was not found by the univariate analyses mitigates somewhat the concern of spurious findings of significance.

Another limitation is based on the study’s working assumption of relative homogeneity within ethnic groups, disregarding intra-ethnic differences. The Asian–Canadian students in the sample derive from nations as diverse as India, Vietnam, and Japan; the “European” countries of origin of the Caucasian students range from Romania to Scotland, and include Israel, which geographically is Asian, although its culture is more consonant with the Western
tradition shared by the European nations. It can be argued convincingly that considerable difference exists between some of the cultures that have been placed into a single ethnic category. While this is true, Asian cultures generally do tend to share a relatively collectivist culture as opposed to the European West's more individualistic culture (Sastry & Ross, 1998), and it must be borne in mind that the presence of within-group differences does not preclude the possibility of between-group differences.

A related consideration involves the length of Asian students' residence in Canada. No attempt has been made to distinguish between students who have left Asia very recently and those whose families, though ethnically Asian, have been living in Canada for decades. A more refined research design that incorporated a length-of-residence variable might become the basis of a fruitful extension of this study.

A final limitation concerns the instrument used for data collection, Crandall et al.'s Intellectual Achievement Responsibility Questionnaire, which may have possible validity issues. The students to whom this measure was administered pointed out that some of the questions appeared dated to today's adolescents (for example, Question 7 begins, "When you lose at a game of cards or checkers ...", neither of which are played often by present-day teenagers). It is possible that such anachronisms may have led some respondents to take the instrument less
seriously. Another question that was raised by participants during administration is unavoidable in forced-choice response questionnaires: how to respond if, at various times, either option might be the appropriate one. For the sake of consistency, all participants were told to choose the option that was more often true; however, many of the responses provided may not be far removed from random choices. A modification of the Intellectual Achievement Responsibility Questionnaire using Likert-type questions rather than the forced-choice format may have greater validity than the original instrument.

Directions for further research

The preceding section made reference to some of the constraints to generalizability of the conclusions arrived at by this study which arise as a result of its limited scope. Already alluded to have been some of the areas in which additional research might prove rewarding:

- An extension of the current study to include gifted students of various grade levels, in recognition of the well-documented finding that locus of control levels change with age.
- The inclusion of a non-gifted control group, to investigate whether the findings of this study apply uniquely to a gifted population or more universally to the general student population of a given age.
• A replication of this study in other geographical locations where a sizable non-Caucasian student population is found.

• A refinement of the research design which adds, for Asian-born students, length of residence in North America as an independent variable, which would make it possible to determine whether locus of control varies with amount of exposure to Western (that is, non-Asian) culture.

• The development of an enhanced, updated locus of control measure, which respondents might perceive as more relevant to their own lives and which would yield more accurate locus of control scores for respondents.

Locus of control, as a construct, has been the focus of extensive research for almost fifty years. This construct impinges on many issues that are of great concern to educators, however, and many lacunæ still remain to be filled before a complete understanding of locus of control in an educational context is attained. Additional research into both the theory and educational applications of locus of control will prove valuable.
References


Appendix I. The IAR Questionnaire
(selected questions)

2 When you do well on a test at school, is it more likely to be
a. because you studied for it, or
b. because the test was especially easy?

3 When you have trouble understanding something in school, is it usually
a. because the teacher didn’t explain it clearly, or
b. because you didn’t listen carefully?

5 Suppose your parents say you are doing well in school. Is this likely to happen
a. because your school work is good, or
b. because they are in a good mood?

7 When you lose at a game of cards or checkers, does it usually happen
a. because the other player is good at the game, or
b. because you don’t play well?

11 Suppose you study to become a teacher, scientist, or doctor and you fail. Do you think this would happen
a. because you didn’t work hard enough, or
b. because you needed some help, and other people didn’t give it to you?

12 When you learn something quickly in school, is it usually
a. because you paid close attention, or
b. because the teacher explained it clearly?

14 When you find it hard to do arithmetic or math problems at school, is it
a. because you didn’t study well enough before you tried them, or
b. because the teacher gave problems that were too hard?

16 Suppose you weren’t sure about the answer to a question your teacher asked you, but your answer turned out to be right. Is it likely to happen
a. because she wasn’t as particular as usual, or
b. because you gave the best answer you could think of?
19 When you don’t do well on a test at school, is it
   a. because the test was especially hard, or
   b. because you didn’t study for it?

22 If a teacher didn’t pass you to the next grade, would it probably be
   a. because she disliked you, or
   b. because your school work wasn’t good enough?

25 Suppose you became a famous teacher, scientist or doctor. Do you think this would happen
   a. because other people helped you when you needed it, or
   b. because you worked very hard?

27 Suppose you are showing a friend how to play a game and he has trouble with it. Would that happen
   a. because he wasn’t able to understand how to play, or
   b. because you couldn’t explain it well?

29 When you remember something you heard in class, is it usually
   a. because you tried hard to remember, or
   b. because the teacher explained it well?

31 If your parents tell you that you are bright or clever, is it more likely
   a. because they are feeling good, or
   b. because of something you did?

34 If a teacher says to you, “Try to do better,” would it be
   a. because this is something she might say to get students to try harder, or
   b. because your work wasn’t as good as usual?