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Adolescent Attachment and Anxiety in Relation to
Gender, Grade, and Academic Achievement Level

by

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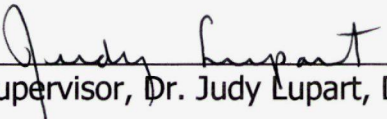
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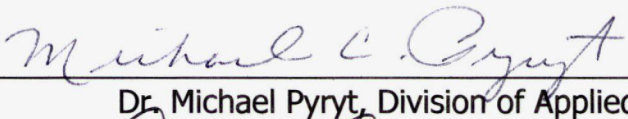
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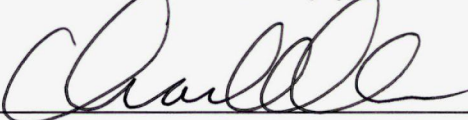
The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies for acceptance, a thesis entitled, "Adolescent Attachment and Anxiety in Relation to Gender, Grade, and Academic Achievement Level" submitted by Devon Wolfe in partial fulfilment of the requirements for the degree of Master of Science.



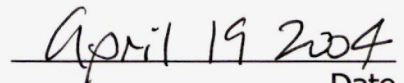
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ABSTRACT

A skilled labour shortage predicted by the government of Canada to occur over the next decade, will require post-secondary education for 70% of jobs. This is occurring at a time when 25% of high school graduates lack the literacy skills to compete in today's job market, one in eight Canadian students does not graduate from high school, and there is a measurable decline in motivation to achieve in academics among adolescents. It appears there are socio-emotional factors that may be specific to gender, grade level, and academic achievement level that should be examined more closely because of their potential impact on overall achievement. More specifically, the quality of attachment relationships that adolescents have with caregivers as well as adolescents' experiences of anxiety in classroom settings, are worthy research areas.

The purpose of the current study was to examine questionnaire responses related to the areas of attachment and anxiety. Participants included six hundred students from in and around the city of Calgary. Gender, two grade levels, and three academic achievement levels defined this sub sample. Students were included in a larger study at the University of Calgary entitled *Gender Differences in Student Participation and Achievement in the Sciences: Choice or Chance?*

Numerical responses to survey items were studied using factor analysis, multivariate analysis, and univariate analysis of variance. Three attachment subscales and three anxiety subscales were identified through factor analysis.

However, there were no gender differences among the subscales. The single grade level difference found between grade 7 and 10 students was for positive attachment experiences. The grade 7 students enjoyed significantly more positive experiences with parents when compared to grade 10 students. Among the achievement groupings, low achievers reported significant differences in comparison to both moderate and high achievers with regard to negative attachment experiences and classroom anxiety. The insecure attachment subscale differentiated low achievers from high achievers. It did not differentiate low from moderate achievers, nor moderate from high achievers.

The single grade level difference may be indicating a normative process of developmental change as adolescents pull away from parents. However, more research is necessary to examine the characteristics of attachment as adolescents develop. The significant differences for low achieving students appear to indicate continued risk for low achievement since these students are already significantly more anxious in the classroom, report more negative attachment experiences, and also present with a significantly lower mean on the insecure attachment subscale.

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To my daughter Bree Tibble, husband Gary Wolfe, and parents Rean and Murray Smith, a heartfelt thank you for the love and unwavering faith they share with me everyday.

DEDICATION

To my clever and beautiful daughter,

Lauren Bree Tibble

and

all my nieces and nephews

accompanying Bree into the future of our family,

Michael, Robbie, and Mark

Shireefa

Madeline and Murray

Eric

and others perhaps yet to be born.

TABLE OF CONTENTS

Approval page.....	ii
Abstract.....	iii
Acknowledgements.....	v
Dedication.....	vi
Table of Contents.....	vii
List of Tables.....	ix
List of Figures.....	x
 CHAPTER ONE: INTRODUCTION.....	 1
Gender and Math Achievement.....	2
Socio-Emotional Aspects of Achievement.....	3
Anxiety.....	5
Attachment.....	6
Statement of the Problem.....	8
 CHAPTER TWO: LITERATURE REVIEW.....	 11
Gender Differences in Academic Achievement	11
Summary	15
Eccles' Model of Achievement Related Choices.....	16
Social-emotional Development and Eccles' Model	19
Summary	22
Anxiety	23
Anxiety in School Settings	25
Math Anxiety and Test Anxiety.....	27
Summary.....	30
Attachment.....	31
Adolescent Attachment.....	32
Attachment Style and Psychological Functioning.....	33
Summary	35
Research Questions.....	36
 CHAPTER THREE: METHOD.....	 38
Sample.....	38
Instrumentation.....	40
Data Analysis.....	41
 CHAPTER FOUR: RESULTS.....	 42
Factor Analysis Results	43
MANOVA Results.....	48
ANOVA and Post Hoc Results.....	49
Summary.....	52

CHAPTER FIVE: DISCUSSION.....	54
Specific Findings.....	55
Interaction Effects.....	55
Anxiety Subscales.....	55
Attachment Subscales.....	57
Implications.....	59
Study Limitations.....	63
Future Research Directions.....	64
REFERENCES.....	66
APPENDIX A: Gender Differences in Student Participation and Achievement in the Sciences: Choice or Chance?.....	87
APPENDIX B: Invitational Letter Describing the Major Research Project.....	93
APPENDIX C: Consent Forms.....	95
APPENDIX D: Academic Choices and Achievement Survey.....	100
APPENDIX E: 28 Items Analyzed Through Factor Analysis.....	125

LIST OF TABLES

Table 1.....	Factor Analysis of Attachment Survey Items.....	46
Table 2.....	Factor Analysis of Anxiety Survey Items.....	47
Table 3.....	Means and Standard Deviations for Female Students.....	50
Table 4.....	Means and Standard Deviations for Male Students.....	51

LIST OF FIGURES

Figure 1	Eccles' Model of Achievement Related Choices	18
Figure 2	Scree Plot for First Factor Analysis.....	44

CHAPTER ONE

Introduction

A recent report on education and labour by the Canadian federal government states that only six percent of new jobs will be held by those who have not finished high school and that fully 70% of jobs will require some post-secondary education in 2004 (Government of Canada, 2002a). In particular math, science, and information technology (IT) careers provide the fastest growing demand for skilled workers (Industry Canada, 2001). This gives students the clear message that education is of paramount importance in the 21st century. As well, mathematics knowledge can be considered basic literacy in our increasingly technological world. Information technology skills and knowledge are basic for higher education and employment considering the cultural and social aspects of daily computer use. Yet 25% of high school graduates lack the literacy skills to compete in the current knowledge-based economy and one in eight Canadian students does not complete high school (Government of Canada, 2002b).

Furthermore, the Canadian Labour and Business Centre states that the concerns with a skilled labour shortage go well beyond the need for post-secondary education (Government of Canada, 2002a). Specifically the

demographic “crunch” to occur over the next decade will see the baby boomer generation retire, leaving many jobs open. It appears that it will take the efforts of all stakeholders to activate the effects of attracting skilled immigrant workers, training aboriginal citizens and other minorities, as well as including more women in the job market, to fill skilled labour positions. Since women account for 54% of low-income Canadians, and represent only 20% of the professionals in natural sciences, engineering, and mathematics, it is timely and important to explore the reasons women are not taking advantage of opportunities offered by math and science careers (Statistics Canada, 2000).

Gender and Math Achievement

Female Canadians continue to be disproportionately under-represented in math and science training programs (Statistics Canada, 2002), which practically guarantees they will not be employed in math or science careers. Additionally, choosing not to pursue math in high school, forces many female students to confront the pipeline phenomenon (Comber, Colley, Hargreaves, & Dorn, 1997; Crombie & Armstrong, 1999; Oakes, 1988; Oakes, 1990). Pipeline courses are considered to be advanced math and science taken at the high school and initial post-secondary levels, with math acting as the critical filter for entry to math and science career pathways (Fennema & Sherman, 1977; Pedro, Wolleat, Fennema, & Becker, 1981). By taking advanced math courses students

keep their choices open to enter math and science related post-secondary programs. Researchers continue to probe gender differences in math, science and computer course achievement that affect subsequent course selection and thus career pathways.

Studies published before the early eighties tend to rely on the biological sex differences theory to explain superior male achievement in math (Benbow & Stanley, 1980; Tittle, 1968). Even though Hyde, Fennema, and Lamon's (1990) meta-analysis revealed a continuing decrease in gender differences in mathematics performance over the last thirty years, notable differences are still measured among the highest math and science achievers with male students outperforming females (Gallagher, 1996; Rebhorn & Miles, 1999). Gallagher (1996) states that the gender stereotypical attitudes of significant adults in the lives of students, appear to be especially influential on math achievement. Likewise, Rebhorn and Miles (1999) concluded that social effects directly impact female math performance. The biological sex differences theory has generally been rejected by researchers in this area. Instead, studies have focused on psychological and social factors.

Socio-Emotional Aspects of Achievement

Eccles' *Model of Achievement-related Choices in Education and Career Decision Making* (1985) has been developed over twenty years of research into the psychological and social factors impacting students'

achievement-related choices. Eccles' model takes into account the various factors that have been shown to contribute to achievement choices in math (Eccles, 1987; 1994; Eccles and Jacobs, 1986; Eccles, Jacobs, & Harold, 1990). Although the role of socializers has been considered by Eccles' model, with regard to education and career choices, the direct impact of caregivers on academic achievement during junior high and high school has not been explored in Canada. Also, the quality of socializer relationships, specifically the quality of attachment to parents experienced by adolescents and the outcome of academic achievement, have not been studied by Eccles.

The first and second phases of a three year Canadian research project, applied Eccles' framework to determine whether institutional, psychological, and sociological influences on academic and career choice differences in the sciences could be explained by currently documented gender differences (Lupart, Cannon, & Rose, 1999). Their results indicated that boys have a significantly higher interest in science and computers than girls (Lupart, Cannon, & Telfer, 2002).

Several studies indicate that female students tend to be disinterested in advanced computer courses and even experience computer anxiety (AAUW, 2000; Koch, 1994; McIlroy, Bunting, Tierney, & Gordon, 2001; Schumacher & Martin, 2001; Teo & Lim, 2000). Computer anxiety, math anxiety, and test anxiety are constructs that are currently discussed

in published research. With anxiety generally being heightened among females (Wigfield & Meece, 1988), this is a research direction that may be particularly pertinent to the study of academic achievement and course selection.

Anxiety

According to several studies in this area, female reluctance to pursue math and science careers may be the result of stereotypes, anxiety disorders, assessment practices, and classroom conditions (Campbell & Connolly, 1987; Cooley, Chauvin, & Karnes, 1984; Rebhorn & Miles, 1999; Reis & Callahan, 1996; Roeser & Eccles, 2000). A related body of research suggests that, anxiety may actually be caused by some school settings (Eccles, & Midgley, 1989; Harter, Whitesell, and Kowalski, 1992; Roeser, Midgley, and Urdan, 1996). These conclusions about stage-environmental fit parallel those from studies into the psychological sense of school membership (Goodenow, 1993). It seems there are several aspects of typical middle schools and junior high schools that are not supportive of the development of students' confidence in academic ability. Such research poses questions about whether adolescents experience sufficiently high levels of anxiety in school settings to impact achievement negatively.

So far research has differentiated math anxiety and test anxiety from generalized anxiety disorders. However, the co-existence of these anxieties has not been explored. Furthermore, the presence of other social-

emotional factors or conditions that are characteristic to adolescent development have not been considered along with existing anxiety. For example, Eccles (1997) indicates that poor stage-environmental fit affects adolescents' daily functioning in classrooms. If it is true that career and life-role choices are formed during the junior high and high school years (Wagner, 1996), and there is an intrinsic decline in the value of academics and motivation to achieve in academics during adolescence (Eccles, Wigfield, et al. 1989), then engaging and motivating school experiences are doubly important. However, even if schools become ultimately sensitive to managing behaviour and achievement expectations to better fit the developmental level of the average adolescent, there will be many students with less than optimal levels of social-emotional maturity. This reality prompts schools to consider the range of social-emotional experiences provided by varying configurations and circumstances of families. Therefore, to more fully understand social-emotional aspects of learning as they relate to gender, grade, and academic achievement, student perceptions about relationships with parents are important.

Attachment

The earliest internalized perceptions of self are provided by attachment relationships with parents or other caregivers (Bretherton, 1992; Carlson, 1998; Chorpita & Barlow, 1998; Jacobson, Edelstein, & Hofmann, 1994; McCormick & Kennedy, 1994). The value of parents and

other significant adults as role models and mentors is widely recognized (Dubois, Holloway, Valentine, and Cooper, 2002; Howard-Hamilton & Franks, 1995; Rhodes, Grossman, & Resch, 2000; Thompson & Kelly-Vance, 2001; Tobin & Fox, 1980). Outcomes for children and adolescents in positive parental or mentorship relationships include overcoming adversity, improved academic achievement, and even advanced academic study. Therefore, it is important for adolescents to be supported by secure attachment or mentorship as they encounter the challenges presented by their expanding social and intellectual lives.

The study of attachment has been founded and focused on young children thus offering limited information about adolescents. However, the available published studies of adolescent attachment relationships concur that an individual's working model of attachment internalized during childhood is based on regularities in experience, whether functional or dysfunctional (Carlson, 1998; Jacobsen, Edelstein, & Hofmann, 1994; Lieberman, Doyl & Matkiewicz, 1999; McCormick & Kennedy, 1994; Paterson, Pryor, & Field, 1995; Priel, Mitrany & Shahar, 1998). The internalized model is defined by patterns of behaviour, regulation of affect, and expectations of self that produce continuity in experience, despite developmental or contextual changes (Carlson, 1998).

Problematic attachment experiences have been linked to poor social-emotional adjustment among adolescents. Social and emotional

factors most proximal to the individual, like attachment relationships and anxiety, could be considered together to contribute new information to the literature at this time. Current research has not provided insights about adolescent attachment relationships and experiences of anxiety as these constructs relate to each other, and to achievement outcomes measured by classroom marks and standardized test results.

It is clear that there is a need to explore the social-emotional aspects of adolescent attachment that offer resilience to students as well as those factors linked to anxiety. Additionally, the study of adolescent anxiety may be foundational to understanding constructs developing through attachment experiences. Likewise, with the high correlation between more specific school-related anxiety, namely math anxiety and test anxiety, academic achievement and career aspirations can be impacted (Kazelskis, Reeves, Kersh, Bailey, Cole, & Larmon, 2000).

Statement of the Problem

Even as gender differences in math performance have diminished over the last thirty years, boys have continued to value math and science course work more than girls. The result has been that males enter the pipeline to math and science careers in greater numbers than females. Evidence of the pipeline effect continues to be published on the American Association of University Women (AAUW) website. The AAUW (2000) states that girls are not getting involved in higher education leading to IT

careers because of the stereotype that girls won't excel in science and technology.

Researchers in this area are examining the social and emotional aspects of academic achievement among females in particular and among all students in general, in order that academic achievement is supported. It has been well established that student career aspirations are influenced by gender stereotypes, expectations for success, and subjective task value (Eccles, 1985). However, at this time very little is known about how social and emotional aspects of adolescent development and functioning affect individuals' academic achievement. Such information is essential because early intervention at the junior high and high school levels will be necessary to effectively address the pipeline phenomenon.

The purpose of this study is to explore the relationship between key social-emotional factors and academic achievement among adolescents. Specifically, adolescent attachment to parents and anxiety in classroom settings may be possible key factors impacting academic achievement level. Considering that the literature on childhood attachment documents the continuity of working models of attachment, it is reasonable to assume that dysfunctional attachment experiences will have a breadth of negative effects for adolescents. Also, because literature on social-emotional dysfunction in adolescents indicates a link to disrupted attachment in

childhood, a connection between anxiety and attachment may be anticipated.

Furthermore, an examination of attachment and anxiety may uncover gender differences and developmental changes experienced by participants. Gender differences with regard to generalized anxiety have been well documented, but less is known about differences between male and female adolescents and their experiences with anxiety in classrooms.

This study attempts to dissect gender differences on the basis of attachment experiences and also experiences of anxiety in school settings. Specifically, the experiences of grade 7 students and grade 10 students are compared, with regard to attachment and anxiety. This study may provide new insights into a possible connection between anxiety, attachment, and academic achievement level.

CHAPTER TWO

Literature Review

A review of the literature of adolescent achievement begins with an overview of gender differences. Then, Jacqueline Eccles' *Achievement Related Choices Model* provides the framework for a well-established area of research on adolescents in school settings. Eccles and her colleagues have contributed empirical research results specifically exploring the impact of student transitions from elementary to junior high school settings. Next, current understandings about the social-emotional aspects of adolescent functioning pertinent to this study are presented, namely the impact of attachment and anxiety on academic achievement. Wherever possible an attempt was made to review cross-cultural studies. This chapter concludes with the research questions pursued by this thesis.

Gender Differences in Academic Achievement

Internationally, gender differences among adolescents are currently noted in reading and math literacy as documented by the *Program for International Student Assessment* (PISA) (OECD, 2000). On average, females consistently and significantly outperform males in reading literacy across all of the member countries of the *Organization for Economic Cooperation and Development* (OECD). This includes Canada and the United States. There are also differences between genders in math literacy. Although they are smaller than those reported for reading literacy, the

math gender differences are still statistically significant. It appears that males outperform females in math literacy in half of the countries participating. This is the trend in Canada but not in the United States. And finally, when examining science literacy across all countries included in the study, gender differences tended to average out. Results for Canada and the United States followed the trend of no significant differences by gender in science literacy.

Science achievement among American students is currently considered poor for both genders based on international rankings (AAUW, 1992). This trend may be rooted in gender activity preferences among adolescents. A case in point being the gender differences reported by Lupart, Pyryt, and Cannon (2001) among a sample of Canadian students, with adolescent boys significantly more interested in science and computers than girls. However, the grade 7 students in this study liked computers significantly more than the grade 10 students, which could contribute to a future more gender balanced trend. It was also documented that children's attitudes and beliefs tend to be patterned after those of parents, particularly mothers (Telfer & Lupart, 2003). Probing parental attitudes and beliefs could be useful to most research about adolescents.

Generally, the reality that females are under-represented in mathematics and science related careers continues to motivate studies of gender differences.

In fact it has been well established that gender differences in math achievement are still apparent among gifted and high achievers at all ages (Benbow 1988; Benbow 1992; Hedges & Nowell 1995; Robinson, Abbot, Berninger, & Busse 1996; Stanley 1990). For example, high achieving females perform slightly better in math through elementary and junior high school while high achieving males perform moderately better in high school. In each case, math and science achievement has not led directly to math and science career choices. It is apparent that research targeting high achieving students could lead to an understanding of other factors affecting academic achievement.

Several researchers suggest that social and emotional forces are at play. Bandura (1997:215) notes that, "Efficacy beliefs predicted interest in, and positive attitudes toward, mathematics, whereas actual mathematical ability did not." In agreement, Eccles' model posits that educational and occupational choices are linked to differences in individual expectations for success and subjective task value. Furthermore, gendered socialization practices are thought to play a major role in shaping expectations and task value. Indeed, Eccles and Jacobs (1986) found that social and attitudinal factors had a greater influence on junior and senior high school students'

grades than did math aptitude. They also suggest that gender differences in math achievement and attitudes are due in part to gender-stereotyped beliefs.

Current beliefs about females' subjective value of math tasks, are culture-loaded. Females are seen to have less confidence in math and science domains and also to place less subjective value on possible career opportunities in these areas (AAUW, 2000). Gender stereotypes complicate this process by deeming boys to be more able in math tasks and girls more able in language tasks. In comparison to boys and men, girls and women have negative self-efficacy (SE) concerning math and the natural sciences (Cramer & Oshima, 1992; Jacobs & Weisz, 1992; Ziegler & Heller, 1997; Ziegler & Stoeger, 2004). Consider also that boys tend to overestimate their specific task performance in comparison to girls (Bornholt, Goodnow, & Cooney, 1994) and that as verbal ability increases so does one's lack of popularity (Ablard, 1997). These attitudes lead in the same negative direction for female math self-concept.

Studies from various cultures document that gender role stereotypes around academic achievement are found throughout North America and Europe, as well as within Israel, China, and Thailand (Tocci & Engelhard, 1991; Ziegler & Heller, 1997). Tocci and Engelhard (1991) gathered data from Thailand and the USA and reported a significant interaction effect between achievement and attitude in math. Their interpretation indicated

stronger statistical significance between female achievement level and positive attitudes toward personal experiences with math learning, its usefulness in society, and appropriateness of math for both genders, than for male achievement level and attitudes. In other words, for girls particularly, lower math scores were related to negative experiences with math, the attitude that math is not entirely useful for society, and stereotypical thinking that math is for boys. This indicates the importance of studies and interventions for girls presenting low achievement in math.

Summary. There has been an almost exclusive focus on gender differences in math achievement over the last twenty years. More recently the need to monitor reading and science achievement has become important because of the changes technology has introduced to learning environments and career opportunities. For example, math learning is impacting science achievement through the pipeline effect, and IT learning is potentially impacting several domains. So to maintain an awareness of the actual academic achievement of students it is necessary to monitor progress in several academic domains. This thesis included classroom marks and standardized scores for math, science, and English, providing robust measurement of achievement.

Also, research on gender differences should be focused on the two groups most likely to show significant gender differences in achievement, namely high achievers and low achievers. By including achievement level

groups, this thesis can possibly identify interaction effects and trends. In this way schools get information that can impact programming more directly.

Finally, because adolescents are impacted significantly by parental attitudes and beliefs, study of adolescent experiences, including school achievement, should investigate the characteristics and quality of attachment relationships. Otherwise there may be understandings about the complexity of the adolescent's family context that are lost. This thesis asks important questions about adolescent attachment experiences. Additionally, consider that adolescents struggle to balance gendered messages from the cultural milieu, the family, but also school. Since school provides a social environment that is different from the family home, and is of growing importance to adolescents, school contexts should be considered in research designs. This thesis asks important questions about students' social-emotional experiences in classrooms.

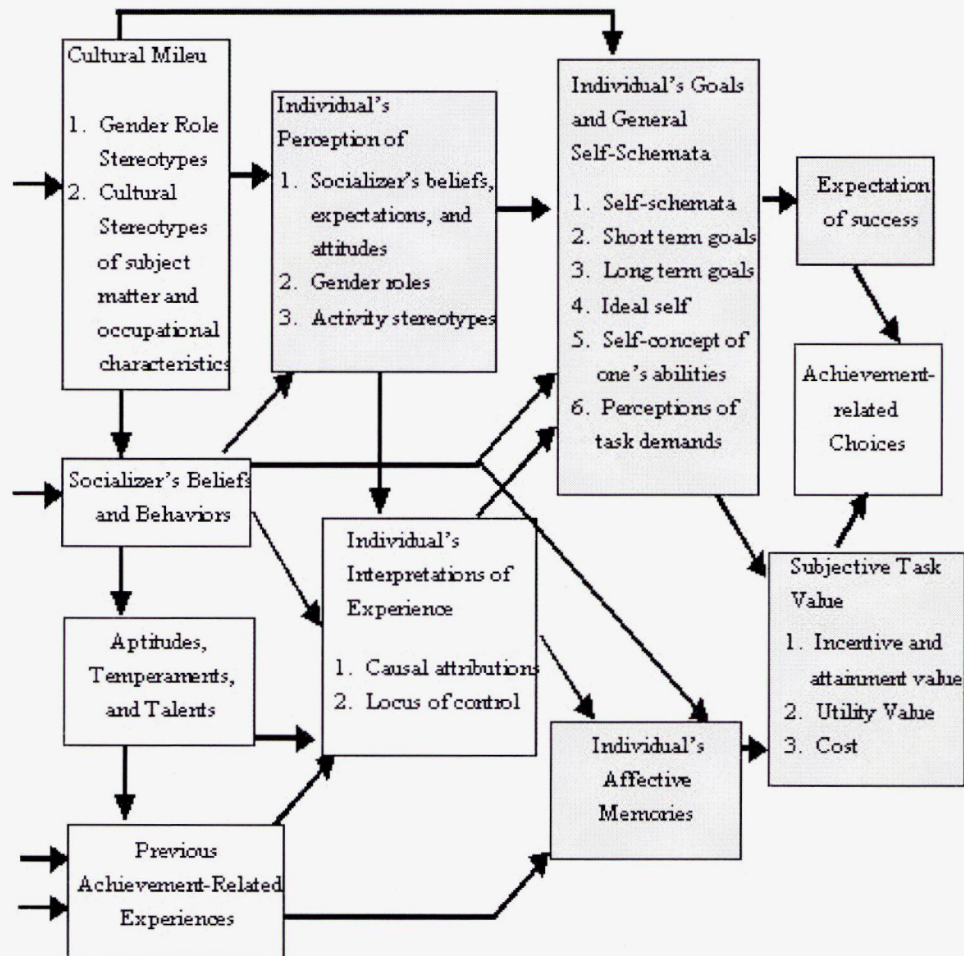
Eccles' Model of Achievement Related Choices

A large body of research by Eccles and her colleagues has focused on adolescents in school settings and has been used to develop a model of achievement-related choices. The research of Eccles and her colleagues examines the primary influences of culture, socialization, and the stage-environmental fit of schools for adolescents, all of which have implications for the impact of social-emotional factors on academic achievement.

Eccles' model provides a comprehensive representation of the interplay of expectancy and value constructs for understanding educational and occupational choices (Eccles, 1992; Eccles, 1994; Eccles, Wigfield, & Schiefele, 1998). This model may be useful for the examination of links to adolescents' experiences of attachment and anxiety because it is both empirically and theoretically grounded in research on adolescents and recognizes the implications of adolescent development, gender, and school contexts. Eccles' research supports the conclusion that social and attitudinal factors have a greater influence on junior and senior high school students' grades than aptitude. These data also suggest that gender differences in math achievement and related attitudes are largely due to: math anxiety, gender-stereotyped beliefs of parents, especially mothers, and the task value students attach to math.

Overall Eccles and her colleagues (Eccles, et al. 1983) have identified ten constructs that impact achievement related choices; 1) the cultural milieu, 2) socializer beliefs and behaviors, 3) individual aptitudes, temperaments, and talents, 4) individual's previous achievement-related experiences, 5) individual perceptions of socializer beliefs, expectations and attitudes, gender roles, and activity stereotypes, 6) individual interpretations of experience, 7) individual goals and general self schemata, 8) individual expectations of success, 9) individual affective memories, 10) subjective task value, (see Figure 1).

Figure 1 Eccles' Model of Achievement-Related Choices in Education and Career Decision Making



Social-emotional Development and Eccles' Model

Three features of Eccles' model are particularly important for understanding the processes of socialization and maturation to be discussed here (Eccles, 1987). First, is the focus on personal interest in making achievement-related choices. Gender differences in academic and vocational choices are legitimized in the model without attempting to compare or rank the choices to some gender standard. Secondly, the forces shaping the individual's perception of viable academic and vocational options are examined. For example, whether students are aware of a spectrum of career options and perhaps willing or encouraged to consider gender role deviant options, are taken into consideration. Thirdly, choices are known to be set in a complex context of social and individual, long and short-term implications. At times adolescents are known to have several possible vocational choices yet these are contextualized by immediate academic course selection and completion, life situation, and availability of role models.

According to Eccles' model math ability perceptions have strong longitudinal effects on both SE and value perceptions (Meece, Wigfield, & Eccles, 1990). In other words, when students perceive they have low math ability, based on previous achievement-related experiences and stereotypes contributed by society or parents, they will tend not to enrol in more math

classes and begin to see math as less valuable to their future. Furthermore, students will internalize a lack of math ability, ultimately feeling that the level of effort they are willing to expend will not be sufficient.

Learners attributing their success to ability and effort are known to have an internal locus of control and thus functional attribution. In contrast, learners attributing their successes to luck and easy tasks are known to have an external locus of control and thus dysfunctional attribution. Unfortunately, researchers describe school environments that actually support dysfunctional attribution of achievement (Eccles, Buchanan, Flanagan, Fuligni, Midgley, & Yee, 1991; Eccles, Lord, & Midgley, 1991; Eccles, Wigfield, et al. 1993; Field, Hoffman & Posch, 1997). Eccles (1997) notes that the transition from elementary to junior high school is particularly problematic to students, for this and other reasons. The environment in junior high classes tends to introduce changes that produce: an increase in extrinsic motivation, more rigorous grading resulting in lower marks for individual students, ability grouping, an increase in teacher control, a decrease in teacher trust of students, less class discussion, a decrease in student autonomy, and a decrease in teacher confidence. In general these features do not support student achievement nor an internal locus of control.

Accordingly, low achieving students are most at risk for stable, internalized, lack of ability as they judge their own competence and

compare themselves to their peers (Bandura, 1982; Garmezy & Rutter, 1983; Marsh, 1990). Middleton and Midgley (1997) found that when students remained preoccupied with achievement comparisons between themselves and peers, they also remained fixated on performance goals. Performance goals like wanting higher marks or wanting to appear to be competent in class, actually interfered with intrinsic task motivation and lead to avoidance strategies in classrooms. In this study of both European-American and African-American students, it was found that performance goals were not related to perceived ability but were positively related to avoidance behaviours in classrooms and test anxiety.

Female students may be assumed to be at increased risk of using avoidance behaviors since they generally are reported to value social approval, equate elevated verbal ability with lack of popularity, are subject to stereotypical thinking about their low ability in math, and tend toward dysfunctional attribution styles (Ablard, 1997; Skaalvik & Rankin, 1990; Wigfield & Meece, 1988; Ziegler & Heller, 1997). Avoidance strategies provide reinforcement for these negative outcomes. Furthermore, studies of negative coping are important to our understandings of student responses to pressures in school settings. Since avoidance behaviours are found in younger children as well, questions about individual trajectories in achievement motivation, have been pursued.

By examining individual differences in academic and motivational pathways and further probing for variations introduced by mental health, Eccles and her colleagues have identified four distinct trajectories (Eccles, Roeser, Wigfield, & Freedman-Doan, 1999). Students were clustered by measures from standardized instruments, of ability self-concept, academic valuing, and mental health. The mental health variable was a composite of depressive affect, self-esteem, and anger scales. The three variables defined a well functioning group, high on all three indicators; a poor motivation group, low on motivation but high on mental health; a poor mental health group, low on mental health but high on motivation; and finally a multiple risk group, low on all indicators. The results indicated that children identified as multiple risk had the lowest self-competence scores and remained lowest beginning at grade three. They also had the lowest academic grade point average and the only group to show a decline in academic achievement from grades four through eight. This study documents a relationship between mental health and academic achievement. Overall, Eccles, Wigfield, and Schiefele (1998) contend that anxiety in particular may continue to develop within students over the school years as students face frequent evaluation, social comparison, and failure.

Summary. Since there is evidence of a link between mental health and individual achievement trajectories, with a characteristic dip in

achievement over the early adolescent grades, it is worthwhile probing for grade level differences in academic achievement. This study focuses on the differences by grade in experiences of anxiety in not only math, but also science, and English.

Eccles' model notes the temporal relationship between socializer's beliefs and values yet no research has clearly targeted the characteristics of attachment relationships nor the strength or quality of those relationships. More specifically, there have not been studies designed to illuminate parent and adolescent attachment relationships, gender or grade differences, nor the resulting impact on achievement. This thesis endeavours to contribute information in these areas.

Indeed, Eccles states the need for more investigation into the physiological and emotional aspects of anxiety (Eccles, Wigfield, & Schiefele, 1998). She has observed that work has diminished in this area because of the similarities between anxiety and lack of academic confidence, which has in turn prompted a focus on the cognitive aspects of anxiety. This thesis attempts to bridge that gap by asking about physical symptoms like nervousness and increased heart rate, during classroom activities.

Anxiety

Non-clinical samples of anxious children continue to go untreated and respond poorly to conventional therapies (Kovacs & Devlin, 1998). The

high frequency of anxiety in childhood, which is 17% to 21% among community samples, begs a distinction between clinical levels and normative levels (Kashani & Orvaschel, 1988; 1990).

Vasey and Ollendick (2000) recognized the dilemma of distinguishing anxiety disorders from normative levels of anxiety. They describe the debate focused on discriminant validity of subcategories of childhood anxiety introduced by the fourth edition of the Diagnostic and Statistical Manual (DSM-IV) (American Psychiatric Association, 2000). It is noteworthy that the familial, environmental, and cognitive factors discussed in the DSM-IV may result in a range of severity from mild and short-lived levels, to clinical levels. As well, resulting anxiety may fall neatly into a DSM-IV category or defy diagnosis.

Whether there is a clinical diagnosis or not, it has been recognized that there is familial risk for anxiety. Temperamental factors that introduce risk for anxiety include neuroticism and behavioral inhibition, both of which appear to be moderately heritable (Robinson, Kagan, Reznick, & Corley, 1992). Secondly, the environment can present children with stressful and uncontrollable events that produce anxious responses. In these cases traumatic conditioning and individual temperament interact with prior learning resulting in heightened risk for anxious responses including phobias (Lonigan, Shannon, Taylor, Finch, & Sallee, 1994). Also, modelling

and vicarious learning of anxious emotion may actually result in childhood phobias more often than traumatic conditioning.

Furthermore, parental behavior that is over controlling or reinforces avoidance in children is positively correlated with childhood anxiety (Dadds, Barrett, Rapee, & Ryan, 1996; Krohne & Hock, 1991). More specifically, children avoiding challenges in the academic and social domains are led to reduced competence, possible failure, and other negative outcomes like peer rejection.

Anxiety in School Settings

In fact Vargo (1996) has found that grade 7 students having been identified by their peers as withdrawn were at risk for concurrent mental health problems. Vargo studied middle class Caucasian students in Ontario by using several standardized instruments probing levels of withdrawal, aggression, self- esteem, and perceived social support. The students identified by peers as withdrawn, manifested more mental health issues than other students in the study. Those identified with low self-esteem were particularly prone to internalizing. Furthermore, perceived low social support was associated with an increase in both withdrawal and aggressive behaviour. This study identifies that lack of social support is powerful in increasing not only mental health issues in withdrawn children but also the overlapping of internalizing and externalizing symptomatology.

Withdrawal as a coping behaviour and the implication of further mental health risk has been discussed by other researchers as well. Children tending to use avoidance or withdrawal, to be insecurely attached, and to habitually interpret the world as threatening, were at significantly higher risk for being clinically anxious (Kirsch & Cassidy, 1998; Schwartz, Snidman, & Kagan, 1996). Cognitively, clinically anxious children tend toward attentional bias for threatening stimuli and for interpreting even ambiguous experiences or events as threatening (Barrett, Rapee, Dadds, & Ryan, 1996; Vasey, Daleiden, Williams, & Brown, 1995). The temporal relationships of attentional bias, behavior inhibition and insecure attachment are not clear. The outcome of anxiety is clear. Particularly since non-clinical groups of students can present the outcome of increased risk for mental health concerns, we are prompted to study the social-emotional experiences of students.

Low achievers may be additionally vulnerable to anxiety. Roeser and Eccles (2000) describe an academic internalizing pattern among low achievers. In this pattern, internalized distress is already present and when coupled with academic difficulty results in: avoidance of academic challenges, failure to persist, withdrawal from activities, and poor achievement (Kellam, Rebok, Wilson, & Mayer, 1994; Kovacs, 1992).

Finally, cognitive regulations of emotion as well as the development of confidence are implicated in anxious affect (Vasey & Ollendick, 2000).

Interestingly, these factors are also central to the internal working model of attachment. So, as anxious children continue their year to year progress through the school system, their emotional development may be at risk.

Several researchers report that as anxious children and adolescents progress through the school system, they are faced with systemic factors that introduce risk (Chu, & Powers, 1995; Eccles, Roeser, et al. 1999; Wigfield, Eccles, MacIver, Reuman, & Midgley, 1991). An estimated 7.2 million (2.5%) Americans experiencing truncated education displayed a relationship to early-onset psychiatric disorders, particularly conduct disorder in male students and anxiety disorder in females (Kessler, Foster, Saunders, & Stang, 1995). Anxiety related to school, namely math anxiety and test anxiety, require additional discussion here.

Math Anxiety and Test Anxiety

Math anxiety is reported by adolescent boys and girls in school settings. The difference by gender is the magnitude of emotional reaction to math, with anxiety heightened among girls (Wigfield & Meece, 1988). Negative emotion in the form of anxiety plays a significant role in math SE. This could impact future decision-making among girls to continue in math courses. In fact a study by Meece et al. (1990) found that math anxiety among adolescents was most directly related to student's perception of ability in math and that math value perceptions predicted course enrolment.

Other research results report a high correlation between test anxiety and math anxiety suggesting they are sufficiently similar to be discussed as one construct (Kazelskis, et al. 2000). In support, Hembree (1990) found that both math and test anxiety relate to generalized anxiety and also that both respond to the same treatment modes. In fact improved math performance was related to the relief of math anxiety and generalized anxiety, suggesting they may all be related. Further confounding our understanding, some research indicates both positive and negative effects of math anxiety on math achievement (Bush, 1991).

Historical and cross-cultural research affirms the negative impact of affective aspects of anxiety on math achievement (Dreger & Aiken, 1957; Eccles, 1985; Hackett, 1985; Ho, Senturk, Lam, Zimmer, Hong, & Okamoto, 2000; Roeser & Eccles, 2000; Wigfield & Meece, 1988). Interestingly, Bush (1991) found that among students improving their math performance, math anxiety levels were also found to be elevated. It is possible that certain groups of students benefit from a particular level of anxiety.

Anxiety levels appear to relate to the affective and cognitive aspects of math anxiety (Ho, et al. 2000). Using data from China, Taiwan, and the United States, these researchers concluded that by examining affective and cognitive aspects of math anxiety separately, there was a differential relationship to math achievement. Affective, short term goals in math may include getting through class without being embarrassed, passing the test,

or passing the course; while cognitive, long term goals relate more to learning new concepts, earning entrance to advanced study, and math achievement for self-satisfaction. Higher levels of anxiety were associated with affective, short-term goals.

Through meta-analysis Ma (1999) measured the correlation between math achievement and anxiety, at a low $-.27$ for the general population. It is noteworthy that this relationship was consistent across: gender, grade level, ethnicity, measurement instruments, and years of publication. Also there was no statistically significant interaction between gender, grade, or ethnicity. However, achievement level was not included as a variable. Overall, the value and enjoyment of math learning for its own sake may be considered an effective intervention for math anxiety.

Math avoidance is the hallmark of math anxiety (d'Ailly, & Bergering, 1992). It follows that math performance will be negatively affected by anxiety levels that are significantly elevated (Engelhard, 1990; Hembree, 1990; Tocci & Engelhard, 1991). In this regard anxious feelings about math indirectly effect: comfort in working with computers, taking statistics classes in the pursuit of higher education, and teaching math to others (Engelhard, 1990). What appears to emerge out of the research examining the constructs of math anxiety and test anxiety is the assertion that it is persistence not ability or gender that results in achievement. Performance

expectancies in math and to a lesser extent the perceived importance of math, strongly and directly affect math anxiety (Meece, et al. 1990).

Summary. There is a high incidence of non-clinical levels of anxiety among children that remains untreated (Kashani & Orvaschel, 1988, 1990; Kovacs & Devlin, 1998). Therefore it is important to know the impact of non-clinical levels of anxiety on academic achievement and whether there are gender or grade differences. These questions have been addressed by this thesis. Also, considering research that contrasts the role of anxiety in affective versus cognitive achievement goals, the role of anxiety could be illuminated further through this study, as both high and low achieving groups have been included.

Since anxiety appears to play a central role in negative emotions and we know that low achievers tend toward an internalizing pattern, work on the emergence of anxiety is important to diverse research areas (Peterson & Colangelo, 1998; Roeser & Eccles, 2000). Additionally, the Family Adaptability and Cohesion Evaluation Scales (FACES) instrument has proven to be a significant correlate to adolescent depression (McKeown, et al. 1997). These researchers found that the level of depressive symptomatology among adolescents is affected by the degree of perceived emotional bonding in a family. Therefore, adolescent attachment may be able to inform as well as be informed by exploring links to anxiety.

Attachment

Since the emergence of attachment theory, from the work of John Bowlby and Mary Ainsworth in the 50's, research has focused on infants, young children, and their mothers. It is now generally accepted that infants and children use a repertoire of adaptive behaviors to interact with parents. These behaviors are shaped by the promptness, consistency and appropriateness of parental response (Bretherton, 1992), resulting in the formation of a working model of attachment, internalized over time.

It may be that critical periods in early development have a defining impact (Chorpita & Barlow, 1998), but also there is evidence of processes at work, which reinforce the initial model. Bowlby (as cited in Bretherton, 1992), explains that stability of working models derives from two sources: the habitual and automatic nature of patterns of behavior over time, and the difficulty of changing dyadic patterns in contrast to changing individual patterns. For example, it takes a great deal of persistence to extinguish temper tantrums in children, since parents are often unknowingly maintaining this behavior. The reciprocal nature of the dyadic relationships and perhaps the strong affective components of those relationships, act to reinforce continuity.

Further to defining behavior mechanisms in early childhood, researchers agree that three attachment styles are identifiable: 1) secure, 2) anxious disorganized, and 3) anxious disoriented (Bretherton, 1992;

Carlson, 1998; Jacobson, et al. 1994). Secure attachment is the result of consistently responsive and caring attention to the growing child. Anxious disorganized and anxious disoriented attachment, result from varying degrees of lack of responsiveness from parents and even neglect or abuse. There is evidence, albeit limited, that the internalized working models of attachment realized in childhood, remain stable throughout adolescence and adulthood (McCormick & Kennedy, 1994).

Adolescent Attachment

Priel, Mitrany, and Shahar (1998) found that internal models of attachment held by individuals, matched peers' ratings, and created an environment that fostered continuity. It seems, we tend to hold the same internal model, or are less likely to question and confront that model, when others expect us to continue behaving as before. Put another way, we tend to live up to, or down to, expectations of significant others in our lives. Among adolescents, friends become increasingly important, yet parents are still significant in their lives. In fact as adolescents continue to mature, and develop a need to be independent, parental attachment remains important.

Adolescents shift from seeking proximity of parents, to enjoying the supportive role of the abstract concept of parental support (Lieberman, Doyle, & Markiewicz, 1999). Indeed, adolescents have reported that their parents were not less important in their support system, but as adolescents mature issues arose that they were more comfortable discussing with

peers. It is clear, that parental attachments influence the quality of social interactions outside the attachment relationship (Kerns & Stevens, 1996). Yet, into late adolescence, parental commitment remains more crucial than parental assistance (Lieberman, et al., 1999). It is true that, parents are better able to support independence in adolescents, by respecting feelings of assertion and actually smoothing the process of adolescents as they gradually assume adult responsibilities. In contrast, adolescents who have not been supported by secure attachment relationships over their earlier development, may actually be vulnerable to the stresses of becoming independent.

More recently, researchers have carried out longitudinal studies of attachment (Carlson, 1998; Jacobsen, Edelstein, & Hofmann 1994) and developmental studies focusing on adolescents (Lieberman, Doyle, & Markiewicz, 1999; McCormick & Kennedy, 1994; Paterson, Pryor, & Field, 1995; Priel, Mitrany, & Shahar, 1998). Each of these studies notes the continued negative impact of anxious attachment on the cognitive functioning of adolescents and implies the executive function of affect with regard to cognition.

Attachment Style and Psychological Functioning

Specifically, affect promotes cognitive organization that has broad and varied impacts on cognition, appearing to put emotion at an executive level of control (Allen, Moore, Kuperminc, & Bell, 1998). Therefore the

outcome of delayed or disrupted emotional development is impaired cognition.

Bowlby (as cited in Bretherton, 1992) found a link between narrative response and three attachment styles, similar to recent findings by Main (1996). Main offered descriptions of adult narratives that fell into four attachment categories. On the positive extreme, a secure-autonomous narrative recounting, of either a favorable or unfavorable life event, was internally consistent, clear, used relevant details, and was reasonably succinct. A coherent-collaborative response like this was found in the majority of adults in low-risk samples, though rarely found in any categories of clinical samples.

On the negative extreme, an unresolved-disorganized narrative recounting was characterized by lapses of monitoring of reasoning and discourse. Particularly during discussion of traumatic or potentially traumatic events, the narrative could shift abruptly to eulogistic speech, lapsed memory for details, or unusual absorption in details. An unresolved-disorganized narrative was clearly linked to clinically distressed populations and childhood histories suggesting disorganized attachment. Only, 7%-10% of narratives from low risk samples were unclassifiable because they lacked a defined discourse strategy, whereas clinically distressed participants provided substantially more unclassifiable narratives. These appear to be direct relationships.

A related empirical study used narratives, the Adult Attachment Inventory (AAI) and moderately at-risk adolescents (Allen, Moore, Kuperminc, & Bell, 1998). These researchers found that preoccupation with attachment experiences contributed to the variance in both adolescents' internalizing and externalizing tendencies and delinquent behavior, as measured by the AAI. A combination of quantitative methods and narrative methods appear to provide relatively robust data in this area.

Furthermore, meta-analytic data revealed that adults with insecure representations of their own attachment were over-represented among populations of parents of disturbed children (van IJzendoorn, & Bakermans-Kranenburg, 1996). Specifically, social, emotional, and behavior disorders in children, appear to be strongly related to parental insecure attachment. Additionally, disorders in adolescent and adult psychological functioning are associated with an extreme, insecure classification on the (AAI). Since there is also some correspondence between spouse's AAI classifications, there may be a cycle of intergenerational transmission. It is plausible that daily functioning, including attempts at learning will be affected by dysfunctional attachment relationships.

Summary. Overall, research on attachment has been focused on early child development until recently. However, with initial evidence indicating that cognitive development is impaired among adolescents having experienced disrupted attachment, it is important to continue

designing research that examines the development of adolescents. Specifically, it is important to examine the adolescents' experiences in attachment relationships and outcomes in the context of school settings, since the realization of potential in academic achievement impacts the future of individuals and of society.

Unfortunately, there appears to be a cycle of intergenerational transmission of dysfunctional attachment (van IJzendoorn & Bakermans-Kranenburg, 1996). This idea proposes a link to psychopathology in adolescents. Specifically, impoverished social-emotional development can lead to negative emotions and other internalized, over-controlling behaviours like anxiety.

Research Questions

The significance of this study rests in its potential contribution to a clearer understanding of the relation of attachment and anxiety to academic achievement. There would be considerable value in documenting differences in experiences by gender, by grade level, and by achievement level when considering attachment and anxiety. Since the impact of adolescent attachment relationships and a possible link to anxiety in school settings has not been previously explored, this research has the potential to contribute to our current knowledge. It could also validate aspects of Eccles' model that indicate direct links between individual affective memories and individual interpretations of experience.

This study posed several exploratory questions:

1. Are there discrete attachment and anxiety item clusters that can be identified statistically from the questionnaire items provided by the participant sub sample?
2. Are there any interaction effects by gender, grade, or achievement level with regard to attachment or anxiety item clusters?
3. What are the differences between female and male students with regard to attachment and anxiety?
4. What are the differences between grade 7 and grade 10 students with regard to attachment and anxiety?
5. What are the differences between high, moderate, and low achievers with regard to attachment and anxiety?

CHAPTER THREE

Method

The present study used data from Phase One of a larger three-phase project entitled *Gender Differences in Student Participation and Achievement in the Sciences: Choice or Chance?* (see Appendix A for a complete description of the Lupart/Cannon project). The present research investigated the effects of student's perceptions of attachment and anxiety in relation to gender, grade, and academic achievement level.

Sample

A sub sample of 600 participants (331 female and 269 male) was used for this master's thesis, from the total sample of 1,419 students. The sub sample consisted of high, moderate, and low achieving students, in grade 7 (N=300) and grade 10 (N=300). Among these groups a total of 200 students were high achievers (59% female and 41% male), 200 were moderate achievers (56% female and 44% male), and 200 were low achievers (50% female and 50% male).

Achievement data used to define the achievement groups included Alberta Provincial Achievement results for grades 6 and 9 from June of 1999, and classroom final marks for grades 7 and 10 from June of 2000. Pearson correlations between classroom marks and Provincial Achievement marks ranged from .61 to .84 in math, science, and language arts or English (herein referred to as English) at each grade level. Participants

were rank ordered according to the combined means. A total of 100 participants for each of grades 7 and 10 were included for each achievement group. For example, students achieving within the top 100 ranked combined means from the total sample of grade 7 students and grade 10 students were included in the high achieving group of the sub sample.

Mark averages for high achievers ranged from 86.83% to 96% for grade 7 students and 81.17% to 98.33% for grade 10 students. Students included in the group of 100 moderate achievers at each grade level, clustered most tightly around the median of the total sample by grade, which was 75.58% for grade 7 and 71.25% for grade 10. The moderate achiever mark ranges were 73.6% to 77.5% for grade 7 students and 68.5% to 74% for grade 10 students. Mark averages for the lowest achievers ranged from 26.5% to 58.5% for grade 7 and 43.7% to 60.5% for grade 10. As well, students included in the low achieving group were ranked as the lowest 100 combined means for each grade. Choosing achievement group participants in this way allowed for the greatest distance between cut-off scores defined by the groups themselves, yet sampled the extremes in student overall achievement.

Instrumentation

The *Academic Choices and Achievement Survey* (Lupart, Cannon, & Rose, 1999) was used in the current research. From the 209 survey items, 28 questions were selected since they were believed to relate to the study of individuals' perceptions of attachment and experiences of anxiety in academic activities (Appendix D). Nineteen questions on the adapted survey focused on attachment with a caregiver intending to probe the quality of students' relationships with parents or guardians. These were used in the current research to examine the role of attachment when considering gender, grade, and academic achievement. Also, nine questions from the adapted survey related to anxiety in math, science, and English. The purpose for posing these questions was to investigate students' experiences of anxiety and nervousness when engaged in academic tasks, in relation to gender, grade, and achievement. Questions 64, 65, 67, 89, 90, 92, 115, 116, 118, 191, 192, 193, 202, 203, 204, 205, 206, 207, and 208 were worded in the negative and so were reverse coded.

Recoding involved programming the computer to reverse the Likert scale on these questions in order to be consistent with the rest of the survey questions. A higher numbered response on the scale then consistently indicated positive functioning or positive affect on the part of the student. For example, question 64 was recoded. It read, "I get nervous

when taking a math test.” When reversed the Likert scale would record a score of 5 for Strongly Disagree and 1 for Strongly Agree, indicating the highest score to be positive affect. Therefore, values for all questions less than 3.0 consistently fell within a range of negative ratings. Dependent variables were the subscale responses.

Data Analysis

Data analyses consisted of Pearson correlations of Provincial Exam results and classroom marks for each grade with regard to math, science, and English, in order to test for the strength and direction of relationships between student marks. Then a factor analysis was employed, using the 28 selected survey questions as dependent variables. Next the six identified item clusters were tested for inter-item reliability using Cronbach’s Alpha. Finally, the item clusters were used for a multivariate analysis of variance (MANOVA). Main effects identified by the MANOVA were further examined through univariate analysis of variance (ANOVA). Additional post hoc testing was performed on the achievement level independent variable since it contained three levels: low, moderate, and high achievers.

Data was analyzed to the $p < .001$ level of significance. Due to the large sample size it is justified to declare this alpha level.

CHAPTER FOUR

Results

This study examined grade 7 and grade 10, female and male students, high, moderate, and low academic achievers, and their perceptions of attachment and anxiety. This chapter reports the quantitative results of data analysis in three sections. First, the factor analysis is presented using the Alpha Factoring Extraction Method for individual survey items, which are expressed as means. Secondly, identified item clusters were used in a MANOVA and significant differences are reported. Thirdly, statistically significant differences from the MANOVA were further examined by univariate ANOVA and the post hoc Scheffe Test of Equality of Error Variances.

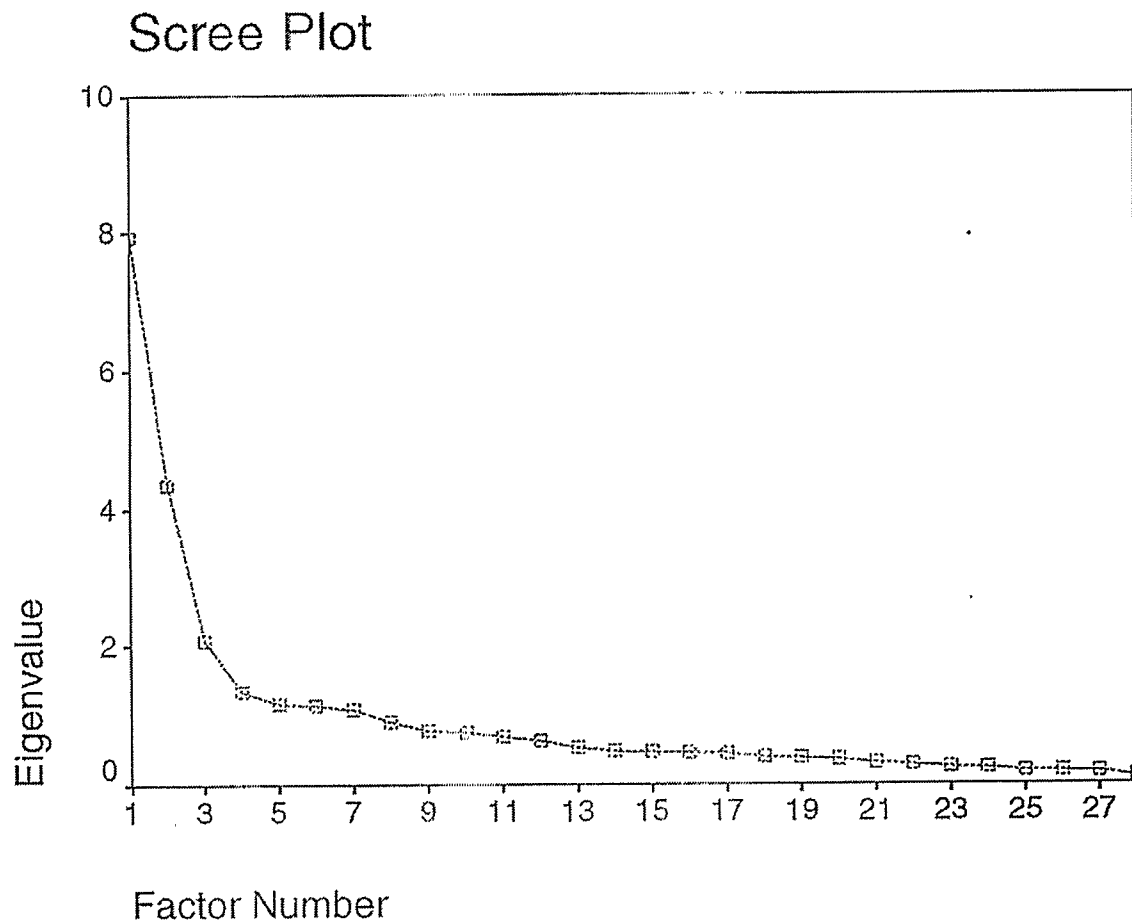
For the purposes of this research, survey items relating specifically to individuals' perceptions of attachment and anxiety were used. The constructs included in the data analysis consisted of: gender, grade, achievement level, nervousness during math/science/English tests, nervousness during math/science/English class, parent sensitivity to worry and anger of students, student's experiences of positive or negative emotions within attachment relationships, and students' sense of security in relationships with parents. Appendix E contains a list of the 28 survey questions analyzed.

All correlations for student marks were significant and positive which supports the use of a composite mean of student marks for further analysis.

Factor Analysis Results

The initial Alpha Extraction factor analysis indicated seven item clusters with Eigenvalues greater than one. However, the scree plot did not clearly indicate seven clusters (Fig. 2). Furthermore, three of the clusters contained attachment survey items that appeared to be very similar. Therefore, a second factor analysis was conducted requiring that all 28 dependent variables be designated to six clusters. The purpose was to test the validity of three of the initial item clusters that attempted to group the survey questions which probed negative attachment experiences.

The four initial attachment item clusters were: 1) positive attachment, 2) negative attachment, 3) angry attachment, and 4) secure attachment. Two questionnaire items included in the secure attachment factor and which had been reverse scored before beginning, were Q207R (I'm afraid that I will lose my parent's love.) and Q208R (I have a terrible fear that my relationship with my parent will end.), presented loadings of .9 and .75 respectively. These were strong values, however with only two items to define the secure attachment cluster, this category may not have been viable. Therefore a second factor analysis was run to see if those two dependent items would load on another item cluster, in a logical way.

Figure 2 Scree Plot for First Factor Analysis

The second factor analysis indicated six distinct item clusters with Eigenvalues greater than one (Table 1 and Table 2). Cluster loadings ranged from .79 to .34 and all dependent items were included in only one cluster. The six item clusters were labelled: 1) positive attachment experiences, 2) negative attachment experiences, 3) insecure attachment, 4) math/science test anxiety, 5) classroom anxiety, and 6) English test

anxiety. Reliability analyses indicated Cronbach's Alpha scores of .91, .77, .78, .86, .77, and .83 for each subscale respectively, indicating coherent and strong categories. Overall, 64% of the variance was explained by this second factor analysis.

The two questionnaire items defining the extra attachment cluster from the first analysis did indeed load negatively on the insecure attachment variable cluster in the second analysis. The values were -.684 for Q207R and -.691 for Q208R. These were deemed to be logical loadings since the reverse scoring allowed for a negative correlation. It was also satisfactory that the implied emotional intensity of all of the items loading on that cluster were similar. In other words, it would have been illogical for Q207R and Q208R to load on the item cluster labelled negative attachment rather than insecure attachment, when comparing the survey questions themselves for similar implied emotional intensity. All attachment and anxiety item clusters were considered to be equally strong for the purposes of further analysis.

Table 1

Factor Analysis of Attachment Survey Items

	Positive Attachment	Negative Attachment	Insecure Attachment
When I'm upset, I am sure that my parent will be there to listen to me.	.79		
I enjoy helping my parent whenever I can.	.77		
I'm confident that my parent will try to understand my feelings.	.76		
It makes me feel good to be able to do things for my parent.	.75		
I talk things over with my parent.	.75		
I can count on my parent to be there for me when I need him/her.	.69		
I'm confident that my parent will listen to me.	.68		
I feel for my parent when he/she is upset.	.68		
I'm certain that my parent will always love me.	.44		
I get really angry because I never get enough help from my parent.		.73	
I get really angry at my parent because I think he/she could make more time for me.		.64	
I think it is unfair to always have to handle problems by myself.		.48	
My parent is always disappointing me.		.42	
I never expect my parent to take my worries seriously.		.37	
I have a terrible fear that my relationship with my parent will end.			.69
I'm afraid that I will lose my parent's love.			.68
My parents only seem to notice me when I am angry.			.48
I get annoyed at my parent because it seems I have to demand his/her caring and support.			.40
I often feel angry with my parents without knowing why.			.34

Table 2

Factor Analysis of Anxiety Survey Items

	Math/Science Test Anxiety	Classroom Anxiety	English Test Anxiety
My heart beats faster when I take a math test.	.86		
I get nervous when taking a math test.	.76		
My heart beats faster when I take a science test.	.61		
When taking a test in science, I get nervous.	.57		
I get nervous if I have to explain my answer in front of a Language Arts/English class.		.74	
I get nervous if I have to explain my answer in front of the science class.		.61	
I get nervous if I have to explain my answer in front of a math class.		.59	
My heart beats faster when I take a Language Arts/English test.			.72
While I am taking a test in Language Arts/English I get nervous.			.67

MANOVA Results

A multivariate analysis using SPSS was performed to examine the six dependent variable subscales in relation to the three independent variables: gender, grade, and achievement level. This created a 3 X 2 X 2 MANOVA. Furthermore, ANOVA was conducted for statistically significant results, followed by a post hoc Scheffe test where necessary.

MANOVA results indicated no interaction effects for gender by grade by achievement level Wilk's $\lambda = .985$, $F(12, 1114) = .752$, $p > .001$; for gender by grade Wilk's $\lambda = .987$, $F(6, 557) = .278$, $p > .001$; for gender by achievement level Wilk's $\lambda = .964$, $F(12, 1114) = .059$, $p > .001$; or for grade by achievement level Wilk's $\lambda = .954$, $F(12, 1114) = .009$, $p > .001$.

However, there was a main effect by grade, Wilk's $\lambda = .929$, $F(6, 557) = 7.124$, $p < .001$, and a main effect by achievement level, Wilk's $\lambda = .827$, $F(12, 1114) = 9.261$, $p < .001$. No main effects by gender were found. The main effects were examined further using ANOVA. The ANOVA results for attachment, to be discussed next, are reported in Table 3. Means and standard deviations for anxiety subscales are reported in Table 4.

ANOVA and Post Hoc Results

The positive attachment experiences subscale was found to be significant by grade $F(1, 574) = 33.262, p < .001$, with grade 7 students ($M = 4.16$) reporting significantly more positive attachment relationships with their caregivers than grade 10 students ($M = 3.81$).

Additionally, negative attachment experiences were significant by achievement level $F(2, 571) = 32.188, p < .001$. The low achievers ($M = 3.49$) reported that their negative attachment experiences are significantly more negative when compared to both moderate ($M = 3.83$) and high achievers ($M = 4.07$). However, there was no significant difference between the negative attachment experiences of moderate achievers and high achievers.

The subscale labelled insecure attachment was also statistically significant by achievement level $F(2, 573) = 13.966, p < .001$. Specifically, low achievers ($M = 3.72$) indicated that they were significantly less secure in attachment relationships than high achievers ($M = 4.26$). However, the means for both groups were above 3.0, indicating positive affect. There were no significant differences between low achievers ($M = 3.72$) and moderate achievers ($M = 3.99$), or moderate achievers and high achievers ($M = 4.26$) with regard to insecure attachment.

Table 3Means and Standard Deviations for Female Students

	Grade 7 N=167						Grade 10 N=148					
	High Ach N=63		ModAch N=57		Low Ach N=47		High Ach N=51		Mod Ach N=51		Low Ach N=46	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
Positive Attachment	4.26	.70	4.28	.49	3.92	.83	4.00	.72	3.82	.76	3.69	.90
Negative Attachment	4.07	.64	3.88	.74	3.54	.71	3.93	.65	3.73	.71	3.48	.79
Insecure Attachment	4.31	.63	4.14	.75	3.79	.82	4.14	.73	3.77	.82	3.80	.83
Math/Science Test Anxiety	2.95	.50	3.21	.63	3.13	.69	3.03	.45	3.15	.61	3.13	.48
Classroom Anxiety	3.53	1.00	3.40	1.01	2.64	1.02	3.37	.99	3.09	.98	3.16	1.00
English Test Anxiety	2.66	1.13	2.58	1.18	2.59	1.15	2.70	1.20	2.54	.94	2.70	1.11

Table 4Means and Standard Deviations for Male Students

	Grade 7 N=131						Grade 10 N=128					
	High Ach N=37		Mod Ach N=43		Low Ach N=51		High Ach N=38		Mod Ach N=44		Low Ach N=46	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
Positive Attachment	4.30	.38	4.04	.65	4.20	.75	3.97	.62	3.66	.79	3.72	.79
Negative Attachment	4.25	.52	3.90	.66	3.35	1.01	4.07	.57	3.80	.63	3.61	.64
Insecure Attachment	4.32	.53	4.13	.69	3.57	.96	4.26	.65	3.88	.69	3.72	.72
Math/Science Test Anxiety	2.87	.54	3.04	.57	3.12	.70	3.23	.50	3.16	.41	3.26	.53
Classroom Anxiety	3.89	.93	3.63	1.03	2.97	1.03	3.75	.80	3.62	.99	3.29	.95
English Test Anxiety	2.47	1.11	2.50	1.19	2.75	1.11	2.34	.94	2.44	1.11	2.65	.97

Classroom anxiety was found to be significant by achievement level, $F(2, 597) = 19.059, p < .001$. Low achievers ($M = 2.98$) were significantly more anxious in classrooms than both moderate achievers ($M = 3.41$) and high achievers ($M = 3.59$). However, there was no significant difference between moderate achievers and high achievers with regard to classroom anxiety.

All subscales significant by achievement level were additionally examined with post hoc Scheffe tests to $p < .001$ alpha level. There were no significant results to report.

Summary

This sub sample of 600 students indicated no interaction effects among gender, grade, and achievement level and also no gender differences with regard to any of the six subscales examined: positive attachment experiences, math/science test anxiety, negative attachment experiences, classroom anxiety, insecure attachment, or English test anxiety.

However, positive attachment experiences were shown to be significant by grade, with grade 7 students reporting significantly more positive relationships with caregivers than grade 10 students. Also, negative attachment experiences and insecure attachment differentiated low achievers from high and moderate achievers. Statistically, low achievers indicated less positive affect than either of the other two groups. Finally,

statistical significance was found when comparing classroom anxiety reported by low achievers with that of moderate achievers and high achievers. Low achievers were again indicating statistically significant negative affect. There was no significant difference between moderate achievers and high achievers with regard to classroom anxiety.

CHAPTER FIVE

Discussion

The main findings of this study were: 1) gender differences are not significant when examining adolescent attachment subscales or anxiety subscales, 2) there is a significant difference by grade for positive attachment experiences, 3) there are no significant differences by grade for negative attachment experiences or insecure attachment, 4) there are no significant differences by grade for any of the anxiety clusters, 5) negative attachment experiences and insecure attachment differentiate low achievers from both moderate and high achievers, 6) positive attachment experiences are not significant by achievement level, 7) there are no significant differences between moderate achievers and high achievers when considering adolescent attachment relationships, and finally that, 8) low achievers were significantly more anxious in classrooms than both moderate and high achievers.

This chapter presents a discussion beginning with specific findings as they relate to the literature, followed by implications of the statistical findings, study limitations, and future research directions.

Specific Findings

Interaction Effects

Lack of any interaction effects indicates that girls were not significantly different than boys in given grade/achievement level groupings, that grade 7 students were not different than grade 10 students in given gender/achievement level groupings, and that academic achievement level did not differentiate grade/gender groupings. These are important findings with regard to research on gifted females, female attribution style and the transition from junior high to senior high school settings (Ablard, 1997; Roeser & Eccles, 2000; Skaalvik & Rankin, 1990; Wigfield & Meece, 1988; Ziegler & Heller, 1997). We can conclude that students are not disproportionately disadvantaged because of the combination of gender, grade, or achievement level.

Anxiety Subscales

The absence of a gender effect for any of the anxiety subscales appears to be contrary to previous findings in adolescent studies that have identified females to be at additional risk for developing an anxiety reaction (Kessler, Foster, Saunders, & Stang, 1995; Wigfield & Meece, 1988). Yet, results are in-line with recent reports of diminished gender differences in achievement in math within the United States and lack of differences in science achievement among international comparisons (Hyde, Fennema, &

Lamon, 1990; Nowell & Hedges, 1998). This may actually be evidence that teaching practices aimed at avoiding gender stereotypes are being effective. Eccles' Model suggests that other forces of socialization emphasizing gender equity, presented by the cultural milieu, may also be at work.

Not only were there no differences between genders when considering math/science test anxiety and English test anxiety, there were no gender differences for classroom anxiety. The lack of significant levels of anxiety among female students found here is in direct contrast to previous discussions of female anxiety in school settings (Eccles & Midgley, 1989; Eccles, Wigfield, et al. 1993; Wigfield & Meece, 1988). Again, best practices by teachers including an attempt to be aware of and avoid promoting gender stereotypes, may be having the desired impact. Additionally, the strength among female students in reading achievement, the diminished differences between genders in math achievement and lack of gender differences internationally in science achievement could account for diminished anxiety among females generally.

These data also report no grade effect for any of the anxiety subscales. Perhaps there is a better developmental fit in junior high school and high school learning environments for these students than the research literature has been documenting (Eccles, et al., 1991; Eccles, Lord, & Midgley, 1991; Eccles, Wigfield, et al. 1993; Field, Hoffman, & Posch, 1997).

Additionally, lack of a main grade effect here may indicate that the transition from junior high to senior high is reasonably well articulated for this sample of students, in contrast to Eccles (1997) research results.

Achievement level was also unable to differentiate groups with regard to anxiety. However, normative levels of anxiety may exist that do not result in the physical symptoms of anxiety, like feeling nervous or an increased heart rate, which are probed by the survey questions.

Attachment Subscales

Without significant results by gender with regard to any of the attachment factors, the impact of gender on adolescents' relationships with parents remains unclear (Rice, 1990). However, the implied similarities among female and male students' experiences of attachment can be interpreted to align with Eccles' model. Results from this study would suggest that there are more similarities than differences in adolescents' relationships with caregivers. The lack of differences may be due to the basic nature of parental influences, recognized by Eccles.

The finding that grade 7 students enjoy significantly more positive attachment experiences than grade 10 students is not surprising, since younger children spend more time with parents. This significant difference may simply be a developmental norm. In fact, there is a known shift from seeking proximity from parents as seen in younger children, to enjoying the

supportive role of an abstract concept of the continuous presence of parents as seen in adolescents (Leiberman, Doyle, Markiewicz, 1999; Maier, 1994). However, child development could be a simplistic explanation and may not address negative aspects of relationships between parents and high school aged teens. Finally, there were no significant differences by grade with regard to negative attachment experiences or insecure attachment, yet these subscales were found to be significant by achievement level.

Specifically, low achievers reported significantly more negative attachment experiences and insecure attachment than both moderate and high achievers. Attachment experiences are related to socializer beliefs and behaviors, and are the primary influences on individual's interpretations of experience, according to Eccles' model. Since low achievers are indicating that they struggle with negative attachment experiences and feelings of insecurity in attachment relationships, while there are no significant differences between the other two achievement groups, it appears that the low achiever group is influenced most directly by their caregivers. These results are in line with Eccles' conclusions for low achievers more so than for moderate or high achievers. Considering that attachment relationships are relatively stable over time and are established before adolescence (McCormick & Kennedy, 1994), it appears that negative or insecure

attachment experiences lead to low achievement, rather than low achievement presenting as a risk factor for attachment relationships.

The temporal outcome of low academic achievement supports the conclusions of many researchers (Allen, Moore, Kuperminc, & Bell, 1998; Bretherton, 1992; Carlson, 1998; Main, 1996). It is of further interest that the differences measured here do not include moderate and high achievers. The low achievers were the only achievement group with significantly lower numerical means, indicating significantly more negative attachment experiences and significantly more insecure attachment. Either these two attachment clusters introduce risk for low academic achievement or positive attachment experiences introduce protection from low achievement. Additionally, because negative attachment experiences and insecure attachment display the same pattern of significance, it may be that they must both be present to produce low achievers, or that they are really representing the same construct.

Implications

There are numerous implications for families and schools, from the study findings. First, families are encouraged to be aware of developmental changes in attachment relationships with their children. Family activities that continue to engage older adolescents in positive relationships with parents are important. However, it can be challenging to be sensitive to the

developmental need for independence and activity preferences of teens. Parents should be encouraged to make use of professionals like teachers and psychologists, who are able to offer expertise and services if necessary. Referral to family counselling is imperative where negative attachment experiences and insecure attachment is known to impact the healthy development of adolescents.

Also, parents should facilitate the role of mentors or adult role models for their adolescents. Significant non-parental adults can indirectly impact school achievement and improve relationships with parents (Rhodes, Grossman, & Resch, 2000; Thompson & Kelly-Vance, 2001). Of importance is the impact that mentorship can have on gifted students and also female students considering math and science career paths (Casey & Shore, 1998; Pyryt, 2000; Lupart, Canon, Telfer, 2002). Additionally, schools providing mentors can strive to improve the student-teacher relationships at the junior high and senior high levels that support academic achievement.

Schools are reminded of the value of focusing on social and emotional aspects of school life and achievement, especially when considering low achievers. Firstly, using cross-curricular methods for teaching will tap the relative strengths of students as they confront concepts in all curriculum domains. Strengths in English can be used to express new learning in math and science for example. Secondly, by encouraging students to take part in

curriculum design, alongside teachers, students are more likely to internalize learning and be reflective about their experiences. Also, peer networks and social learning will be enhanced since female students in particular, tend to prefer group learning and projects using social networks (Eccles, Jacobs, et al. 1993; Porath, 1996). The Carnegie Council on Adolescent Development (2000) has suggested using smaller learning communities that eliminate tracking and get students working together. This cannot be done with a narrow view of curriculum, teaching, or learning.

Visionary school leaders will be necessary for schools to truly break from tradition and create classrooms where students lead, facilitate, and collaborate. Classrooms where students are self-directed and inspired by each other but also where they choose teachers as natural mentors, are highly desirable. Cooperative learning activities and peer tutoring should be spontaneous resulting in students feeling and acting like leaders sometimes, and supportive group members at other times. Radical thinking needs to be more acceptable within schools. For example, teacher teams that use the arts for teaching core classes and daily physical education used to teach math without paper and pencil, require both teachers and students to work together, outside a comfort zone. Teaming in this way requires that teachers and hopefully students, take full ownership of the curriculum and in so doing actually create seminar groups and classrooms within classrooms to

meet the changing needs of students. Student assessment should look different also. By measuring student outcomes through reflective practices instead of traditional quizzes and unit tests, students would be able to tell us what they have already learned, what they need to learn next, how they learn best, and what they want to learn. Unfortunately, at this time teachers know the answers to those questions

Gifted students are probably the most easily frustrated when classroom structures and procedures lack flexibility and student self-direction. Gifted students can be discouraged and overlooked by inflexible classroom procedures, yet these students are known to value opportunities to learn along with their teachers (Mingus & Grassl, 1999). A point of interest is that gifted students may have several peer groups based on age, academic ability, social networks, and extracurricular interests. These peer groups can be powerfully positive in a school by supporting gifted students to belong and participate. Schools are obligated to provide strong role models whom relate well to gifted students, leading students to reach their potential in all spheres of life.

Thirdly, schools should be aware that attribution retraining is effective (Ziegler & Heller, 1997; Ziegler & Stoeger, 2004). It is probably not an overstatement that all effective teachers are sensitive to negative attribution and actively work to confront those cognitions. Moderate achievers or gifted

achievers that have not taken advantage of advanced math and science courses can be impacted by teacher's attempts to encourage students to challenge themselves. Teaching that focuses on the emotional aspects of students' experiences, provides the best possible learning climate for inclusion and academic success.

A fourth point informs the role of school counsellor and the use of programs targeting emotional development and career planning. Schools could step beyond just assigning a mentor to students appearing to be at risk. School could see mentorship as a must for every student not overtly supported by a trusted adult. Schools should spend time planning and acting on their unique role in the development of the whole student and that student's future. This role is pivotal (Lupart & Barva, 1998). Career counselling should consider the student's current social and emotional health, academic achievement, access to role models, preferences and abilities, and future aspirations.

Study Limitations

There are two limitations to the current study, which were difficult to avoid and require further discussion. Firstly, since most Canadian schools deal with ethnically diverse populations it would have added important information to know the ethnic backgrounds of students. Ethnicity may actually contribute to differences in academic achievement. Also, it is not

clear whether cultural stereotypes are confusing these data. It is possible that, attachment relationships are different among cultures and experiences of anxiety are impacted by cultural beliefs.

Secondly, several questions were not included in the interest of keeping the questionnaire to a reasonable length thus being completed by students, in one sitting. Yet, questions probing students' awareness of cultural stereotypes and personally held stereotypes could have been useful. Stereotypical views of academic domains may have assisted in interpreting the lack of gender differences. It is possible that the attention educators have paid to the representation of gender in printed learning resources, has yielded changes in stereotypes about math and science among adolescent students.

Future Research Directions

Adolescent attachment is a developing area of research. Both qualitative and quantitative data in this area would continue to result in positive school reform. What is the full spectrum of emotions that characterize attachment relationships among adolescents? How do attachment issues and emotions affect daily school functioning? What are the salient developmental aspects of changing attachment relationships? Also, the emergence of anxiety among adolescents could inform attachment

understandings and further clarify the differences between normative and clinical levels of negative emotions. These are valid research directions.

Eccles and her colleagues have laid a strong foundation, prompting a comparison to Canadian schools and students. Many of the studies cited in this thesis are American, and Canadian schools of course, are different. How different? Future research should encourage researchers across Canada to provide data describing their province. Both the use of best practices and the actual experiences of students in classrooms would be useful information to link to the social and emotional factors of academic achievement. Ongoing research into the classroom experiences of learners should be a commitment of each school jurisdiction. Yearly surveys and semi-structured interviews could be put into place at minimal cost, especially if each school made these data part of their yearly school development plan.

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APPENDIX A

Gender Differences in Student Participation and Achievement in the Sciences: Choice or Chance?

Overview

The *Gender Differences in Student Participation and Achievement in the Sciences: Choice or Chance?* study examined junior and senior high school students' academic and achievement related choices with a focus on high-achieving girls, and the reasons for their under-representation in physical science related careers (Lupart, Cannon, & Rose, 1998). The study was guided by Eccles' Model of Achievement-Related Choices (1994), which was developed to determine why individuals choose certain occupations over other possible choices. The specific objectives of the Lupart/Cannon study were:

1. To investigate the key personal and educational factors, that contribute to junior and senior high school participation and high achievement in the sciences for males and females.
2. To identify the factors, that most directly contribute to decisions on the part of males and particularly females, to pursue programs and careers in science and related disciplines.
3. To explore roots of differences and similarities for males and females in early decisions about adult life-role and career choices.

4. To investigate parent/teacher/counsellor influences on student participation in the sciences.
5. The employment and assessment of the value of Eccles' Achievement-Related Choices Model.

Participants

Four Calgary area school districts agreed to participate in this study: Calgary Board of Education, Calgary Roman Catholic Separate School District, Rocky View School District, and Foothills School District. Selected schools represented the socio-economic strata of the City of Calgary and surrounding rural area. System administrators responsible for coordinating research within their districts were contacted and provided an overview of the Lupart/Cannon project, including sample parent information letters and sample letters of consent. Selected school administrators were contacted based on recommendations of system administrators. High schools were selected and approached for participation first, and the corresponding feeder schools were requested to join the study. A total of 14 senior high schools and 17 junior high schools were included in the final sample.

Over 6000 information and consent packages were delivered to participating school where secretarial staff labelled the packages and sent them to all grade 7 and 10 students to take home to their parent(s). Parents were asked to return signed consent forms even if their child was not

participating. This procedure followed Freedom of Information and Protection of Privacy (FOIPP) regulations.

The positive response rate was approximately 1500 (25%) with a balance between females and males. A total of 1,419 usable questionnaires made up the final sample including 870 (61%) grade 7 students and 549 (39%) grade 10 students. Of the grade 7 cohort, 462 (53%) were female and 408 (47%) were male. Of the grade 10 respondents, 300 (55%) were female and 249 (45%) were male. The total sample was 765 (54%) females and 657 (46%) males. Divided into quadrants, 255 (18%) of the student sample were grade 10 boys, 229 (21%) were grade 10 girls, 454 (32%) were grade 7 girls, and 412 (29%) were grade 7 boys.

Instrumentation

The 209 item student survey used in the Lupart/Cannon study was called "Academic Choices and Achievement Survey" (Lupart, Cannon, & Rose, 1999) (APPENDIX D) and was based on Eccles' *Michigan Study of Adolescent Life Transitions Questionnaire* (MSALTQ) developed by Eccles and colleagues. The survey adapted MSALTQ items to address specific objectives of the Lupart/Cannon study. Results of Eccles' work support the validity and reliability of the MSALQT instrument to assess achievement and vocational development of children and youth (Eccles, 1994; Eccles, Barber, &

Jozefowicz, 1999; Eccles, & Jacobs, et al. 1990; Eccles, Jacobs, Harold, Yoon, Arbreton, & Freedman-Doan, 1993).

The *Academic Choices and Achievement Survey* (Lupart, Cannon, & Rose, 1999) contains the following sections: 1) background information (eg. Gender, family status, level of parental education), 2) general (eg. Schoolwork, self esteem), 3) relationship with father and/or mother, 4) interests and value of math, language arts/English, science, and computers, 5) future plans and career choices, 6) adult roles in society, 7) friends, 8) family attachment.

A 5-point Likert scale response was required for most questions where 1=strongly disagree, 2=disagree, 3=neither agree nor disagree, 4=agree, 5=strongly agree. Reverse scoring was used for negatively worded questions where 1=strongly agree, 2=agree, 3=neither agree nor disagree, 4=disagree, 5=strongly disagree. This scoring system allowed for comparison of various results.

Procedure

In December 1999 the research team carried out a pilot study in order to 1) practice and standardize administration procedures, 2) develop procedures for contacting schools/teachers to set up administration times, 3) review FOIPP protocols, and 4) determine administration time required for

students to complete the surveys (30-45 minutes for grade 7 and 20-30 minutes for grade 10).

Surveys were administered in the schools from January to June, 2000 by teams of two graduate research students to ensure adequate supervision and safety. Each team was responsible for arranging convenient times for survey administration with science teachers and school administration. A science activity package was available to non-participating students if requested, or teachers administered appropriate student activities.

The following standardized administration procedures were followed by each team: 1) an explanation as to how the classroom survey would be administered, 2) information about the survey and that it was going to ask them questions about their attitudes, plans, career decisions, and demographic information, 3) there were no right or wrong answers but that their individual response was the most desirable, 4) a guarantee that FOIPP procedures were being followed, 5) the steps taken for anonymity, secure storage of data and exclusivity of results. As students filled in their surveys a graduate student approached each participating student to ensure that they were authorized to participate and to assist in accurate record keeping. Each returned survey was assigned a research number for confidentiality and student name lists were subsequently destroyed.

Alberta Achievement Test scores were collected from Alberta Learning. Grade 6 results were collected for the grade 7 sample and grade 9 results were collected for the grade 10 sample. Each school provided the final school-awarded marks for grade 7 and grade 10. These achievement scores along with data from the questionnaires were entered into SPSS for statistical analyses.

Summary. Results from the *Gender Differences in Student Participation and Achievement in the Sciences: Choice or Chance* study are documented in the Gold Report (Lupart, Cannon, & Telfer, 2002).

APPENDIX B

Invitational Letter Describing the Major Research Project

February 8, 2000

Dear Parent/Guardian:

My name is Dr. Judy Lupart. I am a professor in the Department of Educational Psychology at the University of Calgary, conducting a research project along with two co-investigators, Dr. Sarah Rose from the Community Health Department and Dr. Elizabeth Cannon from the Department of Geomatics Engineering. We have received approval from Calgary Roman Catholic Separate School District to carry out this research and we would like to invite your child to participate in our study "Gender Differences in Student Participation and Achievement in the Sciences: Choice or Chance?"

This letter is to provide information regarding our research project, so that you can make an informed decision regarding your child's participation. The purpose of this study is to investigate the key influences on junior and senior high school students' choices for various activities, courses and careers, particularly in the sciences. Overall there will be approximately 3,000 students participating in this part of the study and since we need to keep track of letters from four school districts and numerous schools we would ask that you fill out and return the enclosed consent form whether or not you wish your child to participate.

If you agree to have your child participate, he/she will be asked to complete a questionnaire designed to investigate achievement-related decisions and participation in academic activities and careers. In addition, we will require access to school awarded grades, provincial achievement data, and your child's provincial identification number acquired either through Calgary Roman Catholic Separate School District or Alberta Learning.

The data collection will be carried out during school hours at your child's school, and it will require approximately 45 minutes to complete. Participation in this study will involve no greater risks than those ordinarily experienced in daily life. You should be aware that even if you give your permission for participation your

(Con't)

child is free to withdraw at any time for any reason without penalty. This includes your child's own decision not to answer a question. Results, which we will be reporting in published articles or graduate student theses, will ensure your child's complete anonymity, and no identifying data will be released to teachers. All information gathered from the questionnaires will be securely stored and will only be accessible to those who are directly involved with this research project.

If you have any questions, please feel free to contact me at 220-6280, or Andrea Lynch at the Office of the Vice-President (Research) at 220-7114. Two copies of the consent form are provided. Please return a signed copy, which indicates your decision concerning your child's participation in this research using the stamped envelope provided. The other copy can be retained for your records.

Thank you for your cooperation.

Sincerely,

Judy L. Lupart, Ph.D.

PS: All returned forms will be eligible for a draw of one of two prizes; For Parents or Guardians: one \$50. Dinner certificate at Earl's Restaurant, and For Student Participants: one \$50. Coupon for any purchase at Club Monaco.

APPENDIX C

Consent Forms

CARDINAL NEWMAN JUNIOR HIGH SCHOOL		
CONSENT FORM		
Research Project Title: Gender Differences in Student Participation in the Sciences: Choice or Chance?		
Investigators:	Dr. Judy L. Lupart Dr. Elizabeth Cannon Dr. Sarah Rose	Educational Psychology Geomatics Engineering Community Health
Funding Agency: Social Sciences and Humanities Research Council of Canada		

The information requested on this form is being collected pursuant to the *School Act – Freedom of Information and Protection of Privacy*. Information acquired through this form has been approved by the Calgary Roman Catholic Separate School District and will be kept secure and access to the information restricted to the researchers and their research assistants.

This consent form, a copy of which has been given to you, is only part of the process of informed consent. It should give you the basic idea of what the research is about and what your child's participation will involve. If you would like more detail about something mentioned here, please ask. Please take the time to read this information form carefully and to understand any accompanying information.

I/We understand that such consent allows the release of my child's school awarded course grades, provincial achievement test results, and provincial student ID number which would be obtained from either Calgary Roman Catholic Separate School District or Alberta Learning.

My/Our child will also be completing a student questionnaire, during a regularly scheduled science class, which will take approximately forty-five minutes to complete. The investigator will, as appropriate, explain to your child the research and his or her involvement, and will seek his or her ongoing cooperation throughout the project. (Parents or guardians must sign/co-sign for children).

I/We understand that participation in this study may be terminated at any time by my/our request or of the investigators. Participating in this project and/or withdrawal from this project will not affect my/our request or receipt of services from the school board or the university.

I/We understand that this study will not involve any greater risk than those ordinarily occurring in daily life.

I/We understand that all responses will be recorded with names being coded to ensure participant anonymity.

PLEASE TURN PAGE OVER

I/We understand that no personally identifying information will be released to teachers or used to report the data in any published reports.

I/We understand that all data, will be kept in a locked file cabinet in a locked office at the University of Calgary and destroyed five years after publication of the study results.

Your signature on this form indicates that you have understood to your satisfaction the information regarding your child's participation in the research project and that you agree or disagree to have your child participate as a subject. In no way does this waive your legal rights nor release the investigators, sponsors, or involved institutions from their legal and professional responsibilities. Your child is free to withdraw at any time. His or her continued participation should be as informed as your initial consent, so you should feel free to ask for clarification or new information throughout your child's participation. If you should have further questions concerning matters related to this research, please contact:

Dr. Judy Lupari	220-6280
Dr. Elizabeth Cannon	220-3593
Dr. Sarah Rose	220-4297

If you have any questions concerning the ethics review of this project, or the way you have been treated, you may also contact the Office of the Vice-President (Research) and ask for Andrea Lynch, 220-2145. If you have concerns about the project itself, please contact the researchers.

THANK YOU FOR YOUR CONSIDERATION.

PLEASE INDICATE YOUR DECISION CHOICE BELOW:

I hereby give my consent for my child:

_____ to participate in this study:
(Please Print Full Legal Name of Child)

YES _____ If YES, please provide student birth date:
Month _____ / Day _____ / Year _____

NO _____

*Since we need to keep track of approximately 5,000 replies from four school districts, we ask that ALL PARENTS/GUARDIANS please sign on the space below, and return this form in the enclosed, stamped envelope.

Signature of Parent/Guardian

Date

*A copy of this consent form has been given to you to keep for your records and reference.



UNIVERSITY OF
CALGARY

APPENDIX C

FACULTY OF EDUCATION

Department of Educational Psychology
ED T302

February 16, 2001

Dear Parent/Guardian:

Re: Part 2 of
Research Project: "Gender Differences in Student Participation
and Achievement in the Sciences: Choice or Chance?"

You will recall that last year you gave your permission for your child or guardian to participate in our research study. We have now completed the first phase of the research and an initial summary report of the findings can be obtained from your school district central office or by direct request to Marcia Inch, by phoning 220-8019.

We are now ready to move onto the second phase of this project. The Calgary Board of Education has given us approval to carry out this research, and we would like to invite you and your child to participate in the Phase 2 sub-sample. In this phase we are interested in looking at the influence of parents/guardians on student career and adult life-role choices, and therefore we would like to invite one, or preferably both, parents/guardians to participate in the study. The continuing participation of your child in Phase 2 will be contingent on one or both parents/guardians agreeing to participate in this Phase.

The overall purpose of this study is to investigate the key influences on students' choices for various activities, courses and careers, particularly in the sciences. Overall there will be approximately 200 students and their parents or guardians participating in this phase of the study. Please fill out and return the enclosed consent form whether or not you and your child intend to participate.

If you agree to have your child participate, he/she will be asked to participate in a brief 1/2 hour telephone interview to be carried out before June 2001 at a mutually convenient time, and to complete a final 45 minute questionnaire during the 2001-2002 school year. These activities are designed to examine achievement-related decisions and participation in academic activities and careers. We will also require access to their school awarded grades for the current school year, as well as for 2000-2001 acquired either through Calgary Board of Education or Alberta Learning.

If you and/or your spouse agree to participate, you will be asked to participate in a brief 1/2 hour telephone interview, and complete a questionnaire designed to examine your influence on your child's achievement-related decisions and participation in academic activities and careers. The questionnaire will be mailed to one or both parents/guardians, and will take approximately 45 minutes to complete. A stamped, addressed envelope will be included for you to return the completed questionnaire(s) to our University of Calgary office. After the completed questionnaire(s) have been returned, you will be contacted to set up a mutually convenient time for the telephone interview. Both components of your participation will be carried out before June, 2001.

Participation in this study will involve no greater risks than those experienced in daily life. Even if you agree to participate, you and/or your child are free to withdraw at any time for any reason without penalty. This includes your child's own decision not to answer a question. Results, which we will be reporting in published articles or graduate student theses, will ensure you and your child's complete anonymity. All information gathered from the questionnaires and interviews will be securely stored at the University of Calgary and will be accessible to only the Research Group who are directly involved with this research project.

If you have any questions, please feel free to contact me at 220-6280, or Pat Evans at the Office of Research Services at 220-3782. Two copies of the consent form are provided. Please return a signed copy which indicates your decision concerning your child's participation in this research using the stamped envelope provided. The other copy can be retained for your records.

Thank you for your cooperation.

Sincerely,


Judy L. Lupart, Ph.D.

PS: All forms returned before March 15, 2001, will be eligible for a draw of one of two prizes: 1 Parents or Guardians: one \$50 dinner certificate at Earl's Restaurant and For Student Participants: a \$50 coupon for any purchase at Club Monaco.

Academic Choices and Achievement Survey

Dear Parent(s)/Guardian(s),

Thank you for your continued support on this project. As mentioned in our recent telephone conversation, please find enclosed the questionnaire(s) for you to complete at your earliest convenience. We would request that you return this within 2 weeks in the stamped, addressed envelope. We appreciate your contribution to this research. Thank you once again for your cooperation.

Dr. Lupart & Dr. Cannon Research Team
Division of Applied Psychology & Department of Geomatics Engineering
University of Calgary
403-220-2960

APPENDIX D**Academic Choices and Achievement Survey****Academic
Choices and
Achievement
Survey**

Name: _____

School: _____

Grade: _____

We appreciate you participating in this study with us, and hope you will find this questionnaire both interesting and fun! The following pages contain a variety of questions about your activities, interests, likes, abilities, future plans, etc. We are interested in your opinion about these matters. Please read and answer each item carefully, and remember there are no right or wrong answers. If you don't understand a question, don't spend a lot of time on it. Just go on to the next question.

All your answers will be kept confidential. Only those working on this research project will see your answers.

Part 1 Background Information

1. What is your date of birth? Month _____ Day _____
Year _____
2. Are you a _____ 1) Female _____ 2) Male
3. Who do you live with?
_____ Mother and father together
_____ Mother only
_____ Father only
_____ Mother + other adult
_____ Father + other adult
_____ Part of the time with each parent
_____ Other (specify) _____

		None	One	Two	Three	Four or more
4.	How many brothers do you have?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

		None	One	Two	Three	Four or more
5.	How many sisters do you have?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

6. What is the highest level of education your parent(s) received?

Mother				Father			
some grade school	some high school	high school graduate	university , technical school or college	some grade school	some high school	high school graduate	university , technical school or college
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

		English	Other
7.	What language is most often spoken at home?	<input type="checkbox"/>	<input type="checkbox"/>

		Language Arts/ English	Math	Science
8.	Which of the following courses are you taking at this time?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Part 2 General Questions About Yourself

	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
9. I do my schoolwork because I want to learn new things.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. I do my schoolwork because it's fun or interesting.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. I do my schoolwork because I feel bad if it's not done.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. I do my schoolwork because the teacher says I have to.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. I do my schoolwork because it makes my parent(s) happy.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. If I get stuck on a problem or make a mistake, I try and figure it out by myself, rather than asking the teacher for help.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. When a group I belong to plans an activity, I would rather organize it myself than have someone else organize it.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. I feel that winning is important.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. I like myself.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Part 3 Questions About Your Dad

The following questions are about your dad or the person who is most like a dad to you. If this doesn't apply to you, go on to Part 4 - Questions About Your Mom

18.	What is your dad's main job?	Works full-time	Works part-time	Currently unemployed	Stay-at- home dad
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

		Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
19.	My dad is happy with his main job.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

20.	I want to be like my dad.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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21.	No matter how well I do in school, my dad doesn't think its good enough.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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22.	My dad takes an interest in my activities.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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23.	I worry about what my dad will say if I don't do well at school.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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24.	I like being with my dad.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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25.	If I need help with my homework, I can count on my dad.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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Part 4 - Questions About Your Mom

The following questions are about your mom or the person who is most like a mom to you. If this doesn't apply to you, go on to Part 5 - General Questions About Your Parent(s)

	Works full-time	Works part-time	Currently unemployed	Stay-at- home mom
26. What is your mom's main job?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
27. My mom is happy with her main job.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
28. I want to be like my mom.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
29. No matter how well I do in school, my mom doesn't think its good enough.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
30. My mom takes an interest in my activities.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
31. I worry what my mom will say if I don't do well at school.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
32. I like being with my mom.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
33. If I need help with my homework, I can count on my mom.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Part 5 - General Questions About Your Parent(s)

The following questions are about your parent, parents or guardian.

	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
34. It is important to my parent(s) that I do things for myself.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
35. I worry about letting my parent(s) down when I do my schoolwork.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
36. It is important to my parent(s) that I stick to a job until it is done.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
37. It is important to my parent(s) that I will be able to support myself and a family.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
38. It is important to my parent(s) that I am employed regularly when I finish high school.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
39. It is important to my parent(s) that I go on to University or college after high school.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
40. It is important to my parent(s) that I do well in school.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
41. It is important to my parent(s) that I have a successful career.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
42. My parent(s) and I talk about what courses/options I should take in school.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
43. My parent(s) and I talk about the future jobs that I might have.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
44. My parent(s) praise me for doing well.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
45. My parent(s) encourage me to do the best on everything that I do.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Part 6 - Questions About Math

	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
46. I think the math that I will learn this year will be useful for my future.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
47. It is important to me to do well in math.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
48. I try to do the best I can in math.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
49. I find working on math assignments interesting.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
50. Compared to other subjects, math is useful.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
51. I like math.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
52. I like math compared to other subjects.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
53. I feel excited and challenged while doing math.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
54. I would take more math courses even if I didn't have to.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
55. I feel that a more advanced math course would be too difficult for me.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
56. I have to work hard to get good grades in math.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
57. I am going to do well in math this year.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
58. I am going to do as well in math this year as my teacher wants me to.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
59. I am going to do as well in math this year as my parent(s) want me to do.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
60. If I were to rank all the students in a math class, from the lowest to the highest, I would put myself in the highest group.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
61. I am good at math.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
62. I am good at learning something new in math.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
63. I would be successful in a career that required mathematical ability.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
64. I get nervous when taking a test in math.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
65. My heart beats faster when I take a math test.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

		Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
66.	No matter how hard I try, I feel I just cannot understand math.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
67.	I get nervous if I have to explain my answer in front of a math class.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
68.	In general, I feel comfortable or okay asking a math teacher for help.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
69.	It is important to my parent(s) that I do well in math.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Less than 15 min.	About 30 min.	About 45 min.	About an hour	More than an hour
70.	In general, how much time do you spend on math homework most days?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Part 7 - Questions About Language Arts/English

	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
71. I think the Language Arts/English that I will learn this year will be useful for my future.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
72. It is important to me to do well in Language Arts/English.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
73. I try to do the best I can in Language Arts/English.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
74. Compared to other subjects, Language Arts/English is useful.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
75. I find working on Language Arts/English assignments interesting.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
76. I like Language Arts/English.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
77. I like Language Arts/English compared to other subjects.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
78. I feel excited and challenged while doing Language Arts/English.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
79. I would take more Language Arts/English courses even if I didn't have to.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
80. I feel that a more advanced Language Arts/English course would be too difficult for me.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
81. I have to work hard to get good grades in Language Arts/English.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
82. I am going to do well in Language Arts/English this year.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
83. I am going to do as well in Language Arts/English this year as my parent(s) want me to do.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
84. I am going to do as well in Language Arts/English this year as my teacher wants me to.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
85. If I were to rank all the students in a Language Arts/English class, from the lowest to the highest, I would put myself in the highest group.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
86. I am good at Language Arts/English.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
87. I am good at learning something new in Language Arts/English.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
88. I would be successful in a career that required writing and speaking ability.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
89. While I am taking a test in Language Arts/English I get nervous.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

		Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
90.	My heart beats faster when I take a Language Arts/English test.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
91.	No matter how hard I try, I feel I just cannot understand Language Arts/English.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
92.	I get nervous if I have to explain my answer in front of a Language Arts/English class.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
93.	I feel comfortable or okay asking a Language Arts/English teacher for help.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
94.	It is very important to my parent(s) that I do well in Language Arts/English.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
95.	In a typical day, how much spare time do you spend reading books, comic books, or magazines?.	Less than 15 min.	About 30 min. <input type="checkbox"/>	About 45 min. <input type="checkbox"/>	About an hour <input type="checkbox"/>	More than an hour <input type="checkbox"/>
96.	In general, how much time do you spend on Language Arts/English homework most days?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Part 8 - Questions About Science

		Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
97.	I think the science I am learning now will be useful for my future.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
98.	It is important to me to do well in science.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
99.	I try to do the best I can in science.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
100.	Compared to other subjects science is useful.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
101.	I find working on science assignments interesting.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
102.	I like science.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
103.	I like science compared to other subjects.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
104.	I feel excited and challenged while doing science.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
105.	I would take more science courses even if I didn't have to.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
106.	I feel that a more advanced science course would be too difficult for me.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
107.	I have to work hard to get good grades in science.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

		Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
109.	I am going to do well in science this year.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
110.	I am going to do as well in science this year as my parent(s) want me to do.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
111.	I am going to do as well in science this year as my teacher wants me to do.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
112.	If I were to rank all the students in science class from the lowest to the highest, I would put myself in the highest group.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
113.	I am good at learning something new in science.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
114.	I would be successful in a career that required scientific ability.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
115.	When taking a test in science, I get nervous.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
116.	My heart beats faster when I take a science test.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
117.	No matter how hard I try, I feel I just cannot understand science.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
118.	I get nervous if I have to explain my answer in front of the science class.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
119.	Students seem to like the science class.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
120.	The science teacher is friendly to us.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

		Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
121.	The teacher makes science interesting in this class.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
122.	I feel comfortable or okay asking a science teacher for help.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
123.	My science teacher is more interested in smart kids than other kids.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
124.	My science teacher shows more interest in the progress of boys than of girls.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
125.	It is important to my parent(s) that I do well in science.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
126.	In a typical day, how much spare time do you spend doing science activities like collecting rocks, collecting insects, or doing experiments?	Less than 15 min. <input type="checkbox"/>	About 30 min. <input type="checkbox"/>	About 45 min. <input type="checkbox"/>	About an hour <input type="checkbox"/>	More than an hour <input type="checkbox"/>
127.	In general, how much time do you spend on science homework most days?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Part 9 - Questions About Computers

	Yes	No			
128. Do you (or your family) own a computer?	<input type="checkbox"/>	<input type="checkbox"/>			

	5 or under	6-10	11-13	14 or over	
129. At what age did you first use a computer?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

	At a friend's house	At school	At a relative's house	At home	At work/ other
130. Where did you first use a computer?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
131. I like computers.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

132. I am good at doing things on the computer.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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	Less than 15 min.	About 30 min.	About 45 min.	About an hour	More than an hour
133. In a typical day, how much time do you spend on the computer?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

134. When you are on a computer, how much of the time do you spend doing each of the following activities?

	None of the time	Less than half the time	Half of the time	More than half of the time	All of the time
Email	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Surfing the 'net	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Assignments/work on the computer.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Programming	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Playing Games	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Part 10 - Questions About Your Future and Career Choices

In the future, I would like a job that . . .

	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
135. Allows me to earn a great deal of money.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
136. Has high status in society.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
137. Provides enough money to support me and my family.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

		Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
138.	Gives me a chance to work on challenging projects.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
139.	Allows me to be my own boss most of the time.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
140.	Gives me a chance to learn new skills and new things.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
141.	Gives me an opportunity to make the world a better place.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
142.	Gives me the ability to combine career and family.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

As things stand now, it is likely that I will:

		Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
143.	Finish high school, then go on to University or College.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
144.	Do more than one University degree (e.g. Master's, PhD, become a medical doctor, lawyer).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
145.	Get married.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
146.	Have children.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

It is likely that I will choose the following as a career option:

		Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
147.	Service/clerical (like childcare worker, beautician, secretary).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
148.	Trade (like welder, carpenter, plumber).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
149.	Protective or military service (like police, officer, firefighter, military).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
150.	Full-time homemaker.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
151.	Farmer.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
152.	Artist (like designer, interior decorator musician, actor).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
153.	Healthcare worker (like registered nurse physical therapist, pharmacist).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
154.	Health professional (like doctor, dentist, veterinarian).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
155.	Science or math-related professional (like engineer, architect, geologist).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
156.	Human services (like teacher, social worker, counsellor).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

		Strongly Disagree	Disagree	Neither agree 33333 3 see nor disagree	Agree	Strongly Agree
157.	Environment-related (like forestry, marine biologist, environmental engineer).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
158.	Information Technology (like computer scientist, computer engineer).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
159.	Other professions (like lawyer, accountant, architect, stock broker).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Part 11 - Questions About Adult Roles in Society

		Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
160.	Men and women should contribute equally to the family income.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
161.	It is difficult for women to have successful careers and raise a family.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
162.	It is difficult for men to have successful careers and raise a family.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
163.	In general, men are better than women in science and engineering.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
164.	In general, women are better than men in math.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

165.	Women have better social skills than men do.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
166.	All in all, it is better for the family if the husband provides most of the family's income and the wife takes care of the home and family.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
167.	Babies and young children need to have their mothers around most of the time.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
168.	It is okay for mothers of babies and young children to have a full-time job.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
169.	Women are better wives and mothers if they also have a paid job outside the home.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
170.	If a husband and a wife both work full-time, the husband and wife should share the housework and childcare equally.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
171.	A working mother can establish just as warm and secure a relationship with her children as a mother who does not work.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
172.	Women can handle the pressure just as well as men when making an important decision on the job.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
173.	Having a job gives a wife a better chance to develop herself as a person than staying at home.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Part 12 - Questions About Your Friends

		Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
174.	My friends influence the courses I will take in school.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
175.	My friends influence my future job plans.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
176.	In general, I prefer to do things with one or two friends, rather than with a large group.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
177.	For me, being popular with girls is important.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
178.	I am popular with girls.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
179.	For me, being popular with boys is important.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
180.	I am popular with boys.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
181.	I am good at making new friends.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
182.	All of my friends are concerned about being popular.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
183.	My friends are very concerned with status in social situations.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
184.	All of my friends try hard at their studies.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
185.	All of my friends get along well with their parent(s).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

		Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
186.	Friends encourage me to do my best in school.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
187.	I would act dumber than I really am to be popular with my friends.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
188.	It's ok to let your schoolwork slip or get a lower grade in order to be popular with your friends.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
189.	To be popular with my friends I sometimes don't try as hard as I could in school.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Part 13 - Questions About Who Raised You

190. Who is the person in your life who raised you – that is, the person who mostly took care of you from the time you were born until age 5. (Circle the correct answer):

1. Mother
2. Father
3. Other - _____ (describe the relationship - adoptive mother, grandmother, etc.)

Do you live with this person now?

Yes / No

The following statements are about your relationship with that person.

		Strongly Disagree	Disagree	Neither Agree Nor Disagree	Agree	Strongly Agree
191.	My parent only seems to notice me when I am angry.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
192.	I often feel angry with my parent without knowing why.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
193.	I get annoyed at my parent because it seems I have to demand his/her caring and support	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

		Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
194.	I'm confident that my parent will listen to me.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
195.	I'm confident that my parent will try to understand my feelings.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
196.	I talk things over with my parent.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
197.	I enjoy helping my parent whenever I can.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
198.	I feel for my parent when he/she is upset.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
199.	It makes me feel good to be able to do things for my parent.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
200.	When I'm upset, I am sure that my parent will be there to listen to me.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
201.	I can count on my parent to be there for me when I need him/her.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
202.	My parent is always disappointing me.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
203.	I never expect my parent to take my worries seriously.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
204.	I think it is unfair to always have to handle problems by myself.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
205.	I get really angry because I never get enough help from my parent.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

		Strongly disagree	Disagr ee	Neither agree nor disagree	Agree	Strongly agree
206.	I get really angry at my parent because I think he/she could make more time for me.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
207.	I'm afraid that I will lose my parent's love.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
208.	I have a terrible fear that my relationship with my parent will end.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
209.	I'm certain that my parent will always love me.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

APPENDIX E

28 Items Analyzed Through Factor Analysis

Anxiety questions:

Q64	I get nervous when taking a math test.
Q65	My heart beats faster when I take a math test.
Q67	I get nervous if I have to explain my answer in front of a math class.
Q89	While I am taking a test in Language Arts/English I get nervous.
Q90	My heart beats faster when I take a Language Arts/English test.
Q92	I get nervous if I have to explain my answer in front of a Language Arts/English class.
Q115	When taking a test in science, I get nervous.
Q116	My heart beats faster when I take a science test.
Q118	I get nervous if I have to explain my answer in front of a science class.

Attachment questions:

Q191	My parents only seem to notice me when I am angry.
Q192	I often feel angry with my parent without knowing why.
Q193	I get annoyed at my parent because it seems I have to demand his/her caring and support.
Q194	I'm confident that my parent will listen to me.
Q195	I'm confident that my parent will try to understand my feelings.
Q196	I talk things over with my parent.
Q197	I enjoy helping my parent whenever I can.
Q198	I feel for my parent when he/she is upset.
Q199	It makes me feel good to be able to do things for my parent.
Q200	When I'm upset, I am sure that my parent will be there to listen to me.
Q201	I can count on my parent to be there for me when I need him/her.
Q202	My parent is always disappointing me.
Q203	I never expect my parent to take my worries seriously.
Q204	I think it is unfair to always have to handle problems by myself.
Q205	I get really angry because I never get enough help from my parent.
Q206	I get really angry at my parent because I think he/she could make more time for me.
Q207	I'm afraid that I will lose my parent's love.
Q208	I have a terrible fear that my relationship with my parent will end.
Q209	I'm certain that my parent will always love me.