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**ARE FEMALES MORE HELPLESS THAN MALES?  
AN OBSERVATIONAL AND ATTRIBUTIONAL ANALYSIS  
IN MATHS AND ENGLISH**

A thesis presented in partial fulfilment of  
the requirements for the degree of  
Master of Arts in Psychology  
at Massey University

Gillian Naomi Hawke  
1993

## ABSTRACT

The present study investigated the under-achievement and participation of females in mathematical areas within the context of the attribution theory. Gender differences for causal attributions and achievement-related beliefs were investigated in Maths and English, employing a methodology which allowed for the subjective construction of the situation by the student. Subjects were 97 from five Maths and English students (50 males and 47 females). Overall, there were no consistent gender differences in attributions for success and failure in Maths and English. Although males perceived themselves as more competent in Maths, there were no gender differences in achievement-related beliefs. However, females displayed more mastery-oriented cognitions in English .

Additionally, the relationship of gender and teacher-student interactions in Maths and English classrooms were investigated, in an attempt to conceptualise the role they have in sustaining gender related behaviours. It was hypothesized that males and females were being treated differently in Maths and English, which in some way affects their attributions for achievement outcomes, and subsequent achievement-related beliefs. Four classrooms (two Maths and two English) were observed for five hours each. Contrary to predictions, there were few significant differences in the contingencies of evaluative feedback given to students, with respect to its frequency, its typical referents, and the specificity of its use.

The results were discussed in terms of their relationship to other studies, and the implications for past and future methods of studying students' causal attributions in mathematical and verbal achievement situations. Alternative mechanisms by which females' self-derogating beliefs might inhibit their participation and achievement in maths-related areas were also considered.

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## TABLE OF CONTENTS

CHAPTER	page
Abstract . . . . .	ii
Acknowledgements . . . . .	iii
Table of Contents . . . . .	iv
List of Tables . . . . .	viii
<b>1 INTRODUCTION . . . . .</b>	<b>1</b>
Gender Differences in Educational Participation and Achievement . . . . .	1
Approaches to Differential Gender Participation in Education and Employment . . . . .	7
<b>2 REVIEW OF LITERATURE . . . . .</b>	<b>10</b>
Attribution Theory . . . . .	10
Causal Consequences . . . . .	14
Learned Helplessness . . . . .	15
Learned Helplessness in the Classroom . . . . .	16
Gender Differences in Learned Helplessness . . . . .	17
An Alternative Explanation . . . . .	20
Methodology . . . . .	21
The Effect of Feedback on Attributions . . . . .	22
Attributions and the Sex-Appropriateness of the Task . . . . .	27
Attributions and Perceived Competence . . . . .	32

<b>3</b>	<b>THE PRESENT STUDY</b>	<b>34</b>
	Recapitulation and Hypotheses	34
	Part One - Observational Study	35
	Gender Differences in Feedback	36
	Gender Differences in Feedback in Maths and English	37
	Part Two - Attributional Questionnaire	39
	Gender Differences in Attributions	40
	Gender Differences in Mastery and Learned Helplessness	43
	Gender Differences in Perceived Competence	43
	Sex-Consistent versus Sex-Inconsistent Tasks	44
<b>4</b>	<b>METHOD</b>	<b>46</b>
	Overview and Design	46
	Subjects	46
	Instruments	47
	Development of the Attribution Questionnaire	48
	Observation Schedule	49
	Pilot Study	50
	Observer Training	51
	Procedure	52
	Introduction of Study to Students	53
	Classroom Observation	53
	Questionnaire Administration	54
	Summary of Procedure	55

<b>5</b>	<b>RESULTS</b>	<b>56</b>
	Section A: Observational Study	56
	Overall Feedback	56
	Feedback Differences in Maths and English	63
	Summary	69
	Section B: Attributional Questionnaire	70
	Gender Differences in Attributions	71
	Gender Differences in Mastery and Learned Helpless	
	Attributions	72
	Gender Differences in Perceived Competence	74
	Sex-Consistent versus Sex-Inconsistent Tasks	75
	Gender Differences in Achievement-Related	
	Beliefs in Maths and English	78
	Summary	81
<b>6</b>	<b>DISCUSSION</b>	<b>82</b>
	Observational Study	82
	Attributional Questionnaire	86
	Gender Differences in Attributions	87
	Relationships Between Attributions and	
	Achievement-Related Beliefs	88
	Gender Differences in Attributions in Maths	
	and English	89
	Gender Differences in Perceived Competence	90
	Proposed Links Between Observational and	
	Attributional Data	90
	Suggestions for Future Research	92
	Conclusion	93
	<b>REFERENCES</b>	<b>96</b>



<b>APPENDICES</b>	<b>106</b>
1 Questionnaire	106
2 Observational Schedule	111
3 Information Letter to Parents and Caregivers	112
4 Verbal Instructions to Students	113
5 Consent Form	114
6 Correlation Matrix for Combined Variables	115

## LIST OF TABLES

TABLE		page
<b>Table 1</b>	Subjects Taken by all Secondary Pupils at 1 July, 1990 . . . . .	4
<b>Table 2</b>	University Degrees Completed by Level of Degree and Main Subject for the Year Ending with the Graduation Ceremony in 1990 . . . . .	5
<b>Table 3</b>	Occupation (Major Group) by Sex for Population Resident in New Zealand Aged 15 Years and Over Gainfully Employed in Full-time and Part-time Labour Force . . . . .	6
<b>Table 4</b>	Percentages of Negative and Positive Feedback Given to Males and Females . . . . .	57
<b>Table 5</b>	Percentages of Intellectual, Nonintellectual, and Conduct by Gender . . . . .	58
<b>Table 6</b>	Percentages of Negative, Positive, and Absent Feedback Given for Conduct, Intellectual and Nonintellectual Activities by Gender . . . . .	60
<b>Table 7</b>	Percentages of Specific vs General Negative and Positive Feedback by Gender . . . . .	62
<b>Table 8</b>	Percentages of Negative and Positive Feedback Received by Subject and Gender . . . . .	64

<b>Table 9</b>	Percentage of Total Feedback Contingent Upon Intellectual and Nonintellectual Work Aspects, and Conduct by Subject and Gender . . . . .	65
<b>Table 10</b>	Percentages of Positive Feedback Contingent on Intellectual and Nonintellectual Work Aspects, and Conduct by Subject and Gender . . . . .	66
<b>Table 11</b>	Percentages of Negative Feedback Contingent on Intellectual and Nonintellectual Work Aspects, and Conduct by Subject and Gender . . . . .	67
<b>Table 12</b>	Percentages of Specific vs General Feedback Given to Students by Subject and Gender . . . . .	68
<b>Table 13</b>	Mean Scores for Attributional Dimensions by Gender . . . . .	72
<b>Table 14</b>	Students Defined as Learned Helpless or Mastery-oriented by Gender . . . . .	73
<b>Table 15</b>	Pearson Correlations Between Helpless and Mastery Attributions, and Achievement-Related Beliefs . . . . .	74
<b>Table 16</b>	Pearson Correlations Between Perceived Competence and Achievement-Related Beliefs . . . . .	75
<b>Table 17</b>	Mean scores for the Attributional Dimensions for Success (s) and Failure (f) in Maths and English . . . . .	78
<b>Table 18</b>	Mean Scores for Achievement-Related Beliefs by Gender and Subject . . . . .	79

## CHAPTER 1

### INTRODUCTION

#### **GENDER DIFFERENCES IN EDUCATIONAL PARTICIPATION AND ACHIEVEMENT**

For whatever reasons, few mathematicians are women. A plethora of research exists which documents discrepancies between males' and females' mathematical achievement. Although there are few gender differences in mathematical ability at the primary school level (Tittle, 1986), by secondary school, males are frequently outperforming females on maths achievement tests, especially those which involve problem solving (Gold, 1990; Hyde, Fennema, & Lammon, 1990; Fennema, Peterson, Carpenter, & Lubinski, 1990; Linn & Petersen, 1985). Moreover, research continues to show that females opt to take fewer advanced Maths courses than males (Elmore & Vasu, 1986), exhibit lower expectations for success and lower estimates of their competence in Maths (Fennema, 1985), have a more negative personal belief system pertaining to Maths, and a greater attrition for females than males in entry to mathematically-related careers (Fennema et al., 1990).

Many assert that gender differences in cognitive abilities are accountable for this disparity, as it is argued that females perform better than males in verbal areas, and males have a superior mathematical ability (Dweck & Licht, 1980). However recent analyses show that previous cognitive gender differences in verbal ability, spatial visualisation, and mathematical computation and concepts have declined, and no longer exist (Jacklin, 1989; Linn & Hyde, 1989). Thus, it appears that any under representation of women in mathematical areas is much larger than any found in other cognitive skills.

Initially, the majority of psychological research which sought to explain the educational, occupational, and social status of women concentrated mainly on the

study of individual differences, and the search for biological explanations of such differences (Tittle, 1986). Recently however, the emphasis has changed, with the research focus being not on the different biological features of the two sexes, but rather, the social interactions during which individuals construct gender related perceptions and responses (Jacklin, 1989).

Of particular relevance to the present study is the quantity of educational research afforded to exploring the ways in which the school experience may facilitate the realisation of gender related differences in achievement, and further contribute to the sexual division of labour in adulthood. Sex differences have primarily been attributed to gender related differences in experiences, including education, and recent research contributes to a better understanding of the characteristics of these experiences (Tittle, 1986).

In order to conceptualise and illustrate the issues fundamental to the present study, recent New Zealand statistics in this area will be presented. Table 1 displays the subjects taken by males and females at secondary school. It is clear to see that females prefer to study language, humanity, domestic and arts subjects, whereas males tend to concentrate more in the "hard science" and technical areas. Interestingly, the numbers of males and females studying English differs only slightly. However, more males take both Maths, and Maths with statistics. This pattern of subject differentiation greatly limits females' choices for further education, and many career opportunities (Loveridge, 1986).

Table 2 indicates that the subject specialisation observed in university, mirrors the distribution of males and females in the same areas at secondary level. Females are consistently obtaining more degrees in humanities and languages than males. Not surprisingly, university mathematics and computer graduates are predominantly male, with the numbers of Doctorates and Masters awarded to males far exceeding those obtained by females.

Table 3 presents the major occupations of New Zealanders, over 25 years old. It is evident from this table that females are still entering jobs which have been stereotypically defined as appropriate for females (clerical, sales and service workers), and males dominate the field in legislation and administration, trade workers, machine operators and assemblers, and agriculture and fishery workers. It is interesting to observe that the number of professional females exceeds the number of professional males. This is probably a function of this category including Health Professionals (e.g., nurses, midwives, dentists, doctors etc.) and Teaching Professionals (e.g., early childhood educators; primary, secondary, and tertiary teachers; special needs teachers).

Data presented in these tables demonstrates that there are clearly discrepancies between males' and females' educational participation and achievement in the New Zealand contemporary education system. Although the data suggests gender differences in many subject areas, the focus of the present study is on the biases observed in Maths (traditionally a masculine domain) and English (traditionally a feminine domain), as literature documents that unequal participation and achievement is greatest in areas which are typically perceived to be sex-typed.

**Table 1***Subjects Taken by All Secondary Pupils At 1 July 1990.*

Subject	Males	Females	Total
<b>English</b>	<b>112 510</b>	<b>112 865</b>	<b>225 375</b>
Language	8 874	10 596	19 470
French	9 854	19 110	28 964
German	2 856	6 152	9 008
Japanese	5 017	7 425	12 442
Chinese	0	2	2
Spanish	65	203	268
Russian	91	86	177
Indonesian	68	82	150
Pacific Languages	87	105	192
Latin	1 856	1 372	3 228
Classical Studies	1 486	3 102	4 588
Language Studies	487	328	815
Maori Studies	4 048	3 430	7 478
Cultural Studies	19	6	25
Social Studies	53 162	51 135	104 297
History	10 813	13 580	24 393
Geography	20 790	19 433	40 223
<b>Mathematics</b>	<b>104 067</b>	<b>97 325</b>	<b>201 392</b>
<b>Statistics</b>	<b>6 783</b>	<b>5 329</b>	<b>12 112</b>
Science	74 802	70 440	145 242
Earth Science	33	5	38
Biological Science	10 130	15 569	25 699
Environmental Studies	82	124	206
Human Biology	944	2 058	3 002
Chemistry	9 010	6 983	15 993
Physics	13 889	4 900	18 789
Physical Science	994	438	1 432
Art (Core)	22 977	21 667	44 644
Art (Special)	11 764	13 467	25 231
Art History	1 176	2 955	4 131
Art Practical	3 609	4 507	8 116
Music (Core)	25 199	24 980	50 179
Music (Special)	4 311	5 441	9 752
Drama	4 348	5 815	10 163
Physical Education	87 440	82 527	169 967
Technical Drawing	38 674	11 330	50 004
Workshop Craft	30 528	7 311	37 839
Engineering Shopwork	7 045	678	7 723

Source: 1991 Educational Statistics of New Zealand.

Table 2

*University Degrees Completed by Level of Degree and Main Subject for the Year Ending with the Graduation Ceremony in 1990.*

Subject	Doctorate		Masters		Bachelors		Totals	
	M	F	M	F	M	F	M	F
<b>Humanities</b>								
Arts	-	-	1	-	11	22	12	22
Ancient History	-	-	-	-	3	3	3	3
Asian Languages	-	-	-	-	4	16	4	16
Chinese	-	-	-	1	2	4	2	5
Classics	-	1	-	-	5	19	5	20
English	3	5	12	27	118	346	133	378
French	1	1	-	4	10	43	11	48
German	-	-	2	1	11	35	13	36
Greek	-	-	1	1	-	3	1	4
History (Economic)	-	-	1	-	19	8	20	8
History	6	1	11	11	153	173	170	185
Indonesian	-	-	-	-	1	2	1	2
Italian	-	-	-	2	1	7	1	9
Japanese	-	-	-	-	12	19	12	19
Latin	-	-	1	1	-	1	1	2
Linguistics	-	-	1	1	7	10	8	11
Maori	-	-	-	-	5	8	5	8
Philosophy	1	-	8	2	40	15	49	17
Russian	-	-	1	-	4	9	5	9
Spanish	-	-	-	3	1	3	1	6
<b>Sub-total</b>	<b>11</b>	<b>8</b>	<b>39</b>	<b>54</b>	<b>407</b>	<b>746</b>	<b>457</b>	<b>808</b>
<b>Mathematics &amp; Computer Science</b>								
Applied Maths	-	-	-	-	19	6	19	5
Computer Science	3	-	12	2	172	25	187	27
Management Science	-	-	-	-	3	1	3	1
Computing Tech	-	-	2	-	5	2	7	2
Information Systems	-	-	-	-	27	15	27	15
Management Science	-	-	-	-	20	6	20	6
Mathematics	2	1	6	1	100	57	108	59
Operations Research	-	-	6	2	22	12	28	14
Pure Mathematics	-	-	-	-	27	19	27	19
Quantitative Studies	-	-	-	-	1	-	1	0
Statistics	-	-	2	1	6	7	8	8
<b>Sub-total</b>	<b>5</b>	<b>1</b>	<b>28</b>	<b>6</b>	<b>402</b>	<b>149</b>	<b>435</b>	<b>156</b>

Source: 1991 Educational Statistics of New Zealand



Table 3

*Occupation (Major Group) by Sex for Population Resident in New Zealand Aged 15 Years and Over Gainfully Employed in Full-time and Part-time Labour Force.*

Occupation	Males	Females
Legislators, Administrators and Managers	109 893	52 395
Professionals	77 805	89 760
Technicians	88 326	62 382
Clerks	36 075	164 736
Service and Sales Workers (1)	66 690	111 744
Agriculture and Fishery Workers	97 191	40 170
Trades Workers	140 637	8 790
Machine Operators and Assemblers	101 262	30 444
Elementary Occupations(2)	65 373	34 401
Not Adequately Defined	11 820	10 509

Source: 1991 Census, National Summary.

## APPROACHES TO DIFFERENTIAL GENDER PARTICIPATION IN EDUCATION AND EMPLOYMENT

Many researchers speculate possible and probable explanations for these inequities. Three principal theoretical approaches have emerged to explain the under-representation of women in formal education, and professional and executive positions (Fiorentine, 1988). The first is the structural barriers approach which contends that inequities in males' and females' achievement in these positions is a result of sex-discrimination that limits females opportunity. That is, because the female gender may be considered a "discrepant status" women may encounter barriers to their mobility. Available research suggests that regardless of profession, women are not expected to perform as well as men (Frieze, Fisher, Hanusa, McHugh, & Valee, 1978). Thus these prejudicial attitudes can affect the initial hiring and training of women, as well as undermining trust and certainty in their competence (Kanter, 1977).

The second approach is the normative barriers approach. This approach exemplifies the attitude that females fear success, and are anxious in achievement situations because of their anticipation of negative consequences in the form of social rejection or loss of femininity (Horner, 1972). Correspondingly, Linn and Hyde (1989) contend that gender differences in career access are a function of specific cultural and situational contexts.

The third approach, the cognitive differences approach, is of most relevance to this thesis. This approach proposes that gender differences in educational and occupational participation are a consequence of gender differences in achievement-related beliefs. That is, females have lower perceptions of competence and lower performance expectations than males (Eccles, Adler, & Meece, 1984; Parsons, Meece, Adler, & Kaczala, 1982), which results in a lack of confidence in their ability to perform successfully in a variety of achievement situations (Fiorentine, 1988).

Closely allied with this approach is attribution theory, which refers to perceptions and inferences about the causes of one's own behaviour, and that of others.

According to this approach, females lack prerequisite confidence in their abilities. Consequently, successes are attributed to "external" or "unstable causes such as luck, and failures to "internal" or "stable" causes such as lack of ability (Weiner, Frieze, Kukla, Reed, Rest, & Rosenbaum, 1971). This attributional pattern, which discounts success while affirming failures, results in females choosing not to enter into and persist with, or perform well in, a wide range of achievement tasks (Fiorentine, 1988).

The purpose of the present study is to examine the nature of gender differences in achievement within the context of the cognitive approach, drawing significantly on the contribution of attribution theory. Specifically, this research will focus on the type of task (i.e., the perceived sex appropriateness of a task) as a determinant of gender differences in attribution and expectation. In search of an explanation for these differences, an observational study was also conducted.

This thesis begins with a comprehensive account of the attribution theory and Weiner's three dimensional taxonomy for explaining success and failure. The concept of learned-helplessness will also be addressed in this section. The behavioural consequences of students' attributions will be detailed, and it will be illustrated how disparate responses to success and failure are associated with very different constellations of achievement cognitions. How these cognitions mediate student's expectations for future outcomes of behaviour, and subsequent achievement strivings will also be discussed. The next section will examine the available literature on cognitive factors that inhibit achievement in females, focusing in particular on the gender differences in causal attributions, and future expectancies.

The subsequent section will then examine one explanation of why success and failure may have a more negative implication for females than males. Teacher-student interactions, and the role they play in sustaining gender related behaviours will be briefly examined. Predominantly, literature which details how feedback given to a

student by their teacher can acquire different meanings depending on the student's sex, and consequently result in different attributions and expectations, will be explored extensively.

The influence that the perceived sex appropriateness of a task has on attributions and subsequent cognitions will be outlined in the next section; and literature, which suggests that females' self-derogating attributional biases are more prominent in subject areas in which males are believed to be more competent than females, reviewed. This will also include some speculation on how differential patterns of feedback received by students in Maths and English may affect causal reasoning. Finally, the relationship between perceived ability, expectancies for future performance, and attributions will be addressed.

## CHAPTER 2

### REVIEW OF LITERATURE

#### ATTRIBUTION THEORY

The general format of a cognitive model of motivation is stimulus--> cognition--> response. That is, an incoming stimulus, viewed as a source of information is encoded into a belief system that gives it "meaning". The subsequent response is then guided by the intervening structure of thought (Baldwin, 1969, cited in Weiner et al., 1971).

In social psychology there exist many formulations of attribution (e.g., Jones & Davis, 1965; Kelly 1967; Nisbett & Ross, 1980; Reeder & Brewer, 1979), all of which emphasize *"that people interpret behaviour in terms of its causes and that these interpretations play an important role in determining reactions to that behaviour"* (Kelly & Michela, 1980, p. 458). However, it is the contribution of attribution theory in the educational setting which is of primary relevance to the present study. Thus, this thesis will encompass predominately those conceptualisations of theorists who consider attribution in the achievement context, specifically concentrating on the formulations of Weiner and his colleagues.

The attribution model of achievement motivation presented in this thesis is guided by the general cognitive approach outlined above. The model is based on the assumption that people generate explanations for their achievement outcomes, and that these beliefs about the causes of success and failure mediate between antecedent stimulus organism transactions and ensuing achievement behaviour. This approach emphasizes individuals' interpretation of events, not the events themselves, and is greatly influenced by the early propositions of Heider (1958).

Of particular interest to this thesis are the formulations proposed by Weiner (1984), who has provided much of the impetus for the development and application of the attribution theory to education. Based on the work of Heider (and others), Weiner (1984) proposed a cognitive dimension to earlier achievement motivation theories, suggesting that people's cognitive reactions to success and failure are important in understanding achievement-oriented behaviour. Weiner's attribution theory is based on the assumption that affective and cognitive reactions to, and thus behavioural consequences of, achievement outcomes depend on the perceived reasons for these outcomes. Implicit is the assumption that individuals naturally search for understanding about why events occur, especially when the outcome is important or unexpected (Stipek, 1988). These perceptions of the causes of achievement outcomes are referred to as causal attributions.

The early postulations of Weiner and his colleagues (1971) included only two causal dimensions: locus of control and stability; subsequently in 1979 Weiner proposed a third dimension to the model, calling it controllability, and later renaming it as responsibility, which encompasses both controllability and intentionality. More recently, Weiner has relabelled the dimension of stability as constancy, although the majority of attributional research still prefers to address these dimensions controllability and stability. The model of primary reference in this thesis will encompass Weiner's most recent propositions.

Weiner (1984) subsumes the causes of success and failure within a three dimensional taxonomy. The first of these is the internality dimension, and is associated with the field of locus of control (Rotter, 1976, cited in Lefcourt, 1976). From the point of view of the individual making the attribution, any causal factor can be described as residing within the person (an internal factor), or outside the person (an external factor). Ability, effort, mood and patience for example, are properties internal to an individual, whereas task difficulty, luck, and teacher bias are external or environmental causes. It should be remembered that it is always the attributor's judgement that determines the location of a particular cause on the dimension.

A second dimension of causality, labelled stability, characterises cause on a stable (invariant) versus instable (variant) continuum. A stable cause is one that is perceived as being relatively unchanging over time. For example, ability, difficulty of a task and patience; whereas luck, effort, and mood are more unstable. Luck implies random variability, effort may be augmented or diminished from one episode to the next, and mood is usually conceived as a temporary state (Frieze & Snyder, 1980).

The third dimension discussed by Weiner (1984) is controllability. Some causes are seen as being within an individual's control, while others are not. For example, some causal factors such as effort, are likely to be perceived as controllable, whereas ability, mood, or task difficulty are uncontrollable causes.

A fourth dimension, incorporated more recently into Weiner's theory, is globality (Weiner, 1986). A global or general cause (compared with a specific one) is seen to have wide, varying implications, whereas a specific cause is relevant to only a limited number of actions (Abramson, Seligman, & Teasdale, 1978). Thus, it is argued that global attributions imply that when individuals confront new situations, their responses will again have little relevance to the outcome. Hence, a student may attribute his or her failure to a specific lack of ability in a particular school subject (specific), or to a more general lack of ability (global). The ramifications of the latter attribution being that deficits in performance are likely to follow in other situations, whereas a specific attribution to lack of ability (eg., in Maths), implies that debilitation is likely to be restricted to Maths situations.

Weiner et al. (1971) originally postulated that in attempting to explain a prior outcome of an achievement-related event, individuals utilize four main causal elements - ability, effort, task difficulty, and luck. That is, the individual assesses his or her ability level, the amount of effort that was expended, the difficulty of the task, and the magnitude and direction of experienced luck. More recently, a wider range of causal factors has been established, including fatigue, personality, mood, interest, illness and bias, as well as causes that are unique to specific situations (Elig & Frieze, 1979; Ross & Fletcher, 1985; Weiner, 1984).

However, the specific causal attributions are less important as determinants of behaviour than the underlying dimensions of the attributions, particularly when trying to predict future achievement-related behaviour (Thomas, 1989). Important to this discussion are students' conceptualisations of ability. Dweck (1986) maintains that there are two distinct notions of what constitutes intelligence. One is the opinion that intelligence is a *fixed entity*, that ability is a stable trait, unaffected by personal effort. If one lacks the prerequisite ability, no amount of effort will lead to success. The other view is that intelligence is an *instrumental-incremental* concept, which develops over time through instrumental behaviour, such as practice and study (Stipek, 1988; Thomas, 1989).

The assumption that ability is a stable trait, and that attributing failure to ability will seriously and deleteriously effect expectations for future success and willingness to approach new achievement situations has traditionally been most popular. However, recent research suggests that ability is not always perceived as a stable capacity (Stipek, 1991). Therefore, depending upon students' notions of what constitutes intelligence or ability, different and contrasting behavioural consequences will be implicated. That is, if ability is perceived to be a variant trait, failure attributed to ability may not result in lower expectations or a desire to avoid achievement situations in future.

Similarly, each of the other basic causes could be interpreted in terms opposite to Weiner's conceptualisations (Ross & Fletcher, 1985). For example, effort could be considered a stable personality trait (a lazy or industrious person), and task difficulty could be viewed as either a stable or unstable cause, as at different times tasks may be thought to be easier or harder (due to fatigue, hunger, temperature, etc). Due to this equivocation in interpretation of attributions, the emphasis in the present study is not on the attribution itself, but the underlying dimensions of the attribution. However, for illustration purposes, the traditional interpretation of the four basic causal dimensions will be employed in subsequent discussion.



## CAUSAL CONSEQUENCES

It is the behavioural consequences of students' attributions which make them relevant to the discussion of motivation in the classroom. Although Weiner and his colleagues also examine the effect of different attributions on students' emotional reactions in achievement situations, to avoid complexity, the affective consequences of attributions were not addressed in the present study.

Much research shows that the types of attributions a person makes, and the way they will behave in achievement situations are closely related to each other. The original theory proposed that causal attribution patterns are related in systematic ways to expectations for future performance, to subsequent achievement strivings, and to the affect associated with achievement outcomes (Dweck & Licht, 1980; Forsyth & McMillian, 1981; Howard, 1984; see Harvey & Weary, 1984; Weiner, 1986).

Logically, within this attributional paradigm certain implications for various causal attributions are apparent. When success is perceived as being the result of possessing ability (an internal, stable factor), maximum security can be derived. Effort attributions for success offer less security than since continued effort must be exerted to maintain positive outcomes, (Frieze & Snyder, 1980). However this attribution is still favourable, since effort is controllable and changeable. Attributing success to external factors, e.g., good luck or an easy task, offers even less security that success will recur.

An opposite pattern of consequences follows failure attributions. Specifically, attributing failure to a lack of ability implies that there is no way the failure could have been avoided, and that it can't be changed to a success in future (except for occasional instances of good luck). In failure situations however, luck attributions are favourable, as future success can be anticipated as luck changes. Similarly, effort attributions for failure are desirable as, unlike ability, this cause is changeable and controllable.

Thus, it is not hard to see why effort attributions are generally considered the most productive for learning. If a student attributes failure to low effort, it would still leave hope for success in the future (assuming he or she was prepared to try harder). When failure is attributed to lack of ability, it is a lot less likely that the student will exert more effort on future tasks, as without the prerequisite ability, no amount of effort would lead to success in the future (Stipek, 1988).

Similarly, attributing success to effort is desirable. This perception implies that although the student realises he or she has the required ability, they would not have succeeded without exerting some effort. However, it has been suggested that attributing success solely to ability is not favourable. Students who do this perceive effort as being unnecessary for success, and because they do not try their best, often they will perform at a level below their capacity. Hence, it appears that attributing success to both ability and effort are most beneficial. Indeed, Nicholls (1976) showed that students would prefer to be seen to both have ability, and to have tried hard when successful, concluding that students want to be perceived as able, but virtuous too.

## **LEARNED HELPLESSNESS**

When failure is attributed to stable factors that the individual is unable to control (eg., a lack of ability), maladaptive behaviour coined "learned helplessness" can develop. Learned helplessness refers to a particular phenomenon by which an individual learns, over a series of trials, that she/he has no control over the outcome of events. One sees no relation between effort and changes in surroundings, or the attainment of a goal (Thomas, 1979). Failure is perceived as insurmountable, and is followed by a deterioration in performance.

The term learned helplessness was originally advanced by Seligman and Maier in 1967 (Abramson, et al., 1978), to describe the debilitated escape-avoidance response shown by dogs exposed to uncontrollable shocks in the laboratory. Seligman found

that dogs who first were subjected to shocks from which they cannot escape, behaved quite differently when exposed to avoidable shock, compared to dogs who had not previously experienced inescapable shock. They appear to lose the ability and motivation to respond to aversive stimulation and simply "give up", acquiring what might be referred to as a "sense of helplessness" .

Just as organisms can learn contingencies, so, too, can they learn about the absence of contingencies (Abramson, et al., 1978). It is proposed also that this pattern of maladaptive responding can be generalised to similar situations, thus significantly reducing the probability that the same animal will attempt to make effective responses in the future, and therefore recognize the presence of a contingency when one does actually exist (Abramson et al., 1978).

These early findings with dogs have subsequently been extended to a variety of other species. More importantly, analogous experiments with human beings have yielded similar results. In human helplessness studies, people who have been subjected to inescapable noise, or inescapable shock, or who have been confronted with unsolvable problems, fail later to escape noise and shock which is escapable, or solve simple problems (e.g., Hiroto, 1974; Thornton & Jacobs, 1971).

## LEARNED HELPLESSNESS IN THE CLASSROOM

Helplessness Versus Mastery-Orientation: The parallels between this general description of learned helplessness, and the behaviour of students who give up when they confront failure in achievement situations are remarkable. Dweck and her colleagues (e.g., Diener & Dweck, 1978; Dweck, 1986; Dweck & Reppucci, 1973) have studied extensively the achievement behaviour of "learned helpless" and "mastery-oriented" students. Essentially, those students who attribute failures to internal, stable, and uncontrollable causes, such as ability, rather than effort, are considered to be helpless. In contrast, those students who attribute both success and failures to

effort are referred to as mastery-oriented (Hokoda, Fincham & Diener, 1990; Thomas, 1989).

The studies of Dweck and her associates, evidence that learned-helpless students tend not to try very hard in any achievement-related tasks, show low task persistence, low goal-setting, low expectations for future performance, and low overall academic achievement. These students believe that there is nothing they can do to escape failure, and that irrespective of any response, failure is inevitable. This perception of failure as insurmountable is associated with attributions of failure to stable, but uncontrollable factors, predominately, a lack of ability (Dweck, 1986; Thomas, 1989).

In contrast, mastery-oriented students show increased persistence or improved performance after failure, and tend to attribute their failure to variable, controllable, internal factors such as lack of effort, or variable situational factors such as task difficulty. The cognitions of these mastery-oriented students imply that their successes are replicable, and their mistakes rectifiable (Dweck, 1986; Eccles et al., 1984; Hokoda et al., 1990;).

## **GENDER DIFFERENCES IN LEARNED HELPLESSNESS**

Much educational research has been devoted to examining possible gender differences in causal attributions, with the results frequently denoting that females appear to be more helpless in failure situations than males. (Bar-Tal & Frieze, 1977; Deaux & Farris, 1977; Diener & Dweck, 1978; Dweck & Bush, 1978; Dweck & Repucci, 1973; Frieze & Snyder, 1980; Howard, 1984; Licht & Dweck, 1984; Simon & Feather, 1973; Sweeney, Moreland, & Gruber, 1982).

That is, females, compared with males make causal attributions which could inhibit learning (Deaux, 1984; Dweck & Licht 1980; Fox & Ferri, 1992; Frieze, Whitely, Hanusa, & McHugh, 1982; Howard, 1984; Nicholls, 1980). They are more likely

than males to attribute success to external, unstable, factors such as luck and task ease, and are less likely to attribute success to their own abilities (Fox & Ferri, 1992). Thus, females do not experience the enhanced self-esteem, and security of future success commonly afforded by males in similar achievement situations (Stipek, 1984).

Moreover, females tend to take responsibility for their failures, attributing them to internal, stable, factors such as a lack of ability (Bar-tal & Frieze, 1977; Fox & Ferri, 1992) neglecting to use effort attributions after failure (Deaux & Farris, 1977).

These attributions are accompanied by differential expectancies for success in males and females, with females tending to have lower initial expectancies for success than males (Deaux, 1984; Frieze & Snyder, 1980). Deaux (1984) proposed that it may not be the process of making attributions that distinguishes males and females, but rather their initial expectancies for success that cause the differences.

According to her model, females initially have low achievement expectations. Hence, they attribute an unexpected, successful outcome to an external or unstable cause such as luck, since a success is not consistent with their low expectations. Since luck is ever changing, there is no reason to expect future success, self-esteem is not increased, and future expectancies for success remain low. Alternatively, failure, which is consistent with expectancies, serves only to confirm females' low expectations, consequently increasing expectancies for subsequent failure. The implication of this low expectation cycle is that females may be condemning themselves to failure through a self-fulfilling prophecy (Erkut, 1983).

New Zealand data on students' responses to success and failure are limited, but generally confirm the pattern of causal attributions, and subsequent achievement-related behaviour observed in other studies. For example, Nicholls (1980) reported that among students of high socio-economic status (SES), males were more likely to choose a difficult task rather than an easier one. Additionally, females were more inclined to ascribe their performance on these tasks to luck than were males.

Another of Nicholl's studies (1984) involved lower SES students. Results indicated that although both males and females performed at a similar level, females were less likely to employ ability attributions for success, and more likely to attribute this success to luck. Males were more likely to attribute failure to a lack of effort or an uninteresting task.

Nicholls (1978) also performed two studies focusing only on reading. The first indicated that despite higher perceived and actual achievement, females still attributed failure to a lack of ability. The second study however did not confirm these results, finding instead that females were more inclined to attribute success to ability, and less likely than males to blame a lack of ability for failure, but attribute it instead to bad luck. Males were still more likely than females to ascribe their failure in reading to a lack of effort.

Lawes (1983) studied gender differences in New Zealand students' attributional constellations. Specifically, Lawes investigated causal attributions for performance in the School Certificate English examination. Her results indicated that males and females did not differ in the explanations they gave for success, but only in failure attributions. Males were more likely to attribute failure to unstable, external causes, whereas females utilised stable, internal causes.

Loveridge (1986) also sought to explore gender differences for causal attributions in New Zealand students. Diverging away from the methodology common to most attributional research, Loveridge measured students' attributions and expectations through an extensive interview, which allowed for the subjective construction of a situation by the student. This method also allowed students to locate causes on an interval scale for each proposed dimension, rather than have the researcher assign the causes to the dimensions, which is common in most other attributional research.

The results of this investigation were only partially conclusive, with males attributing success in science to "involvement and interest" more often than females, but not to "ability and skill" as predicted. The hypothesis that females would be more likely to

attribute success in reading to "involvement and interest", and "ability and skill" was unsupported.

## AN ALTERNATIVE EXPLANATION

Although gender differences in achievement-related attributions have been observed by many researchers, results are far from conclusive. Despite the abundance of published studies that report that a subject's sex is a determinant of behaviour and attitudes, including attributions, many researchers remain sceptical, challenging established findings.

For example, Sweeny, et al. (1982) found that in failure situations males tended to employ internal attributions, while females blamed external causes. Dweck & Repucci (1973), and Parsons et al. (1982), also failed to find gender differences in ability attributions for failure. Further, it is unknown how many of the unpublished studies have found no significant differences in causal attributions (Megarry, 1984).

Frieze et al. (1982) performed a meta-analysis of 21 studies which examined gender differences in attributions for success and failure. They concluded that in actuality, there was not substantial support for any of the theoretical models proposed to account for such differences. The only consistent differences their analyses yielded, was the tendency of females, compared with males to make greater luck attributions for both success and failure.

Similarly, Sohn (1982) conducted an effect-size analysis on studies pertaining to students' achievement attributions. Again, it was concluded that the empirical evidence supports only the proposition that females utilise luck attributions more frequently than males when explaining a success. No consequential relationships were found between sex and the other three main types of achievement self-attributions. Thus, it may be that proposed gender differences in cognitions following success and failure are all in the mind.

## METHODOLOGY

The procedure used in attributional research has frequently been criticised, with many investigators asserting that the way in which students' causal attributions are obtained may be directly responsible for the equivocal findings pertaining to gender differences in attributions (McHugh, Frieze, & Hanusa, 1982; Parsons et al., 1982), concealing true differences.

The plurality of studies investigating the nature of gender differences in causal reasoning in educational settings have employed structured questionnaires that were based on rating scales (Elig & Frieze, 1979; Fox & Ferri, 1992). As structured questionnaires have had much widespread appeal, there has been little exploration into other possible techniques which may also be potentially useful in obtaining attributions. However, the structured questionnaire has been criticised due to little attention being given to the function and meaning of the behaviour for the people concerned (Maehr & Nicholls, 1980). Frieze et al. (1982), emphasized that students' own judgements of an achievement situation need to be integrated into the achievement process. In other words, *"it is, finally, the subjective construction of the situation by the individual that is of critical importance"* (Maehr, 1983, p.90). Rarely, both structured and open-ended questionnaires have been used (e.g., Parsons et al., 1982).

Hence, Forsyth and MacMillan (1981) recommend that instead of the researcher imposing causal dimensions upon students' attributions as they interpret them, it may be more appropriate for students to locate causes on an interval scale for each proposed dimension themselves. Further, McHugh et al. (1982) advocate that if attributional research is to advance, various situational determinants of sex differences in attributions need to be considered. The majority of studies of sex differences measure attributions about outcomes in experimentally contrived tasks or by requiring participants to make causal attributions for a series of hypothetical outcomes (Stipek, 1984). An incredible 87% of the studies reported in the review by Sohn (1982), employed such experimentally-contrived achievement tasks.



Although it is believed that this may be the most effective way to measure the generalized attributional tendencies or attributional styles of the student (McHugh et al., 1982), this approach is frequently criticised as these tasks can have only a limited relevance to the subjects, and possibly do not correspond to the attributions they would give for a more salient event (Frieze, Sales & Smith, 1991).

## THE EFFECT OF FEEDBACK ON ATTRIBUTIONS

Another factor which has been extensively explored in an attempt to conceptualize the nature of gender differences in attributions, is the effect of different types of feedback on casual reasoning. It is hypothesized that females learn to blame themselves for their failures because both teachers and other adults see them as lacking competence, and somehow communicate this to them. Yet, research does not support this assumption. It seems that females are on average more successful in achievement situations than males, and consistently get higher grades. Females are also rated more favourably on behavioural and personality characteristics, and female teachers see the behaviour of females as being closer to their conception of the ideal student than males' (Goebes & Shore, 1975).

Further, females receive far less disapproval, both "official" (e.g., detention) and informal from both male and female teachers, even though females and males did not differ on any observed behaviours (Lee, 1973; Meyer & Thompson, 1956). Thus, in general, it seems that females are treated and regarded more favourably in many areas. Why is it then that despite females consistently achieving higher than males, and receiving less disapproval from teacher, that they frequently display learned helplessness?

For a long time it was assumed that it is males' and females' general socialisation histories that determine their response to failure feedback (Dweck, Davidson, Nelson & Enna, 1978). That is, it was believed that males, due to greater independence

training develop their own standards of excellence, so external evaluation means little to them.

Alternatively, females are thought not to develop these independent standards in the way males do, but remain dependent on the feedback of others to gain information on the adequacy of their performance (Dweck et al., 1978). Females may be more oriented to teacher approval, and self-reinforce for effort, neatness, and good behaviour (Nicholls, 1980). Hence, when a male receives negative feedback, he can accept it or reject it depending on whether it corresponds with his own standards. The same feedback can have different meaning to a female, who will probably infer that this is a true indication of her performance and abilities (Dweck & Goetz, 1978).

Recently, it has been suggested that it is not generalised response tendencies that determine differential responses by females and males to failure feedback, but instead specific histories with particular agents, namely adults, as they are the major evaluators in all academic environments (Dweck & Goetz, 1978). Implicit in this assumption is that failure feedback must somehow acquire different meanings to males and females. Dweck and her colleagues (1978) sought to conceptualize the nature of gender differences in responses to failure feedback by analysing the pattern of feedback given to students by their teachers. The focus of their study was on teachers' use of negative feedback, its frequency relative to positive feedback, its typical referents, and the specificity of its use.

Results of this study have helped resolve the puzzle. Although females seemed to receive more positive and less negative evaluation than males overall, this was only with respect to nonintellectual aspects of their work (neatness, instruction following, speaking clearly). In terms of absolute amounts of feedback for the intellectual quality of work (competence or correctness) there appeared to be no overall tendency for one sex to receive a greater amount of either positive or negative feedback.

What was relevant however, was the way in which negative feedback was used, and the type of attributions which followed it. Overall, males received a greater amount

of negative feedback. Moreover, negative feedback was more ambiguous in its referents for males, with nearly half relating to form and presentation aspects, rather than content. This compared with about 90 percent of the of the positive feedback relating directly to their intellectual competence.

In contrast, less than 80 percent of the positive feedback received by females addressed the intellectual quality of their work, with about 20 percent relating to presentation aspects. Conversely, the majority of negative feedback they received was directly concerned with intellectual aspects of their work. Hence, it is obvious that there are distinct gender differences in the degree to which positive and negative feedback are valid indicants of their intellectual ability as demonstrated by their academic performance. Warren and Cairns (1972), similarly advocate that when evaluative feedback is used indiscriminately, and for a wide range of nonintellectual behaviour, it loses its meaning as an evaluation of the quality of the student's performance, and criticism can easily be attributed to some characteristic or attitude of the agent, rather than to the adequacy of performance.

Another striking difference was evident when the explicit attributions made by teachers for students' successes and failures were examined. When males failed, teachers generally attributed it to lack of effort, a failure to follow instructions, or the messiness of the work (i.e., motivational factors). In fact, teachers attributed males' failures to lack of motivation eight times more often than they did females'. Females' failures, on the other hand, were attributed to errors in the work itself. This criticism was often also accompanied by praise for motivation and effort.

In conclusion, Dweck's research reveals that the differential pattern of praise and criticism given to males and females may lead them to interpret evaluation in contrasting ways. As a result of these feedback patterns, when a male receives failure feedback, he was able to conclude that the evaluator simply didn't like him, or that it was nonintellectual aspects of their work which were at fault. Even when males did conclude that their work was intellectually inadequate, they were able to blame motivational factors.

In contrast, the negative feedback given to females was highly specific with regard to intellectual aspects of their work. Moreover, little of the negative feedback given to females was for conduct or nonintellectual aspects of their work, although males were often criticised for these reasons. Females are accustomed to receiving praise, and know that teachers generally view them as highly conscientious and hard working in their academic work. Thus, they are less likely to interpret criticism as a result of a teacher who simply doesn't like them, and because insufficient motivation is a less salient factor in determining females' failures, they have little choice but to accept that intellectual failures can only reflect an objective evaluation, and a lack of true ability.

This deduction lends itself to the belief that they are incapable of future academic success, thus leaving them with a sense of helplessness. Yet males who experience this same failure are accustomed to criticism in achievement-related contexts, can more easily disregard failure feedback, and can continue to perceive themselves as capable (Dweck & Licht, 1980).

Interested in the implications of this research, Dweck and her colleagues continued their investigations, this time seeking to determine whether these observed patterns of feedback serve as causes of sex differences in the interpretation of failure feedback. They sought to understand how the use of negative feedback determined its meaning for males and females. In order to do this, they applied the different contingencies of work-related feedback observed in the previous study, under experimental conditions. From this, they were able to evaluate the impact of this criticism on students' subsequent performance in an achievement situation (where all subjects experienced failure), and their attributions for this failure.

The results of this study confirmed that any student (male or female) exposed to the contingencies of feedback that females commonly receive ("teacher-girl" condition), where all negative feedback referred to the correctness of their answers, will generally interpret failure feedback as indicating a lack of ability. Regardless of the students's sex, only 25% of students in the "teacher-girl" condition used effort as an

explanation for their failure. In comparison, more than 75% of the students in the "teacher-boy" condition (those who received criticism common to males in the classroom, referring sometimes to correctness, but other times to neatness), did not ascribe their failures to a lack of ability, opting instead to use effort attributions for their failure.

In other words, those students who received a mixture of solution-relevant and solution-irrelevant feedback, were much more likely to see failure as a reflection of their effort or of the negative attitude of the evaluator, than of a lack of ability. Hence, it is evident that the pattern of criticism students receive is very influential on their interpretation of their failures.

A further interesting aspect of the differential influences of failure feedback on males and females emerged from another study by Dweck and Bush (1976). Results of this investigation indicated that failure feedback can acquire different meanings and impact for the two sexes, depending upon the sex and age of the evaluator. That is, when feedback was given to females by an adult evaluator, in particular a female adult, they evidenced greater helplessness than did males. They were more likely to blame their lack of ability for their failures, and their subsequent performance was typically impaired. With a male adult evaluator however, there was a greater tendency to attribute failures to insufficient effort, which led to a greater improvement in performance.

In comparison, males tended to attribute their failures to a lack of effort with an adult evaluator of either sex, and continue to persevere in the face of failure. These results provide further evidence that it is not the differing socialisation histories of males and females that influence their responses to failure, but rather their differing evaluative interactions with particular agents, suggesting again that what should be analyzed is the pattern of evaluative feedback that males and females receive from different evaluators.

Neale (1978) performed an observational study very similar to that of Dweck et al. (1978) in New Zealand classrooms. In particular, Neale was interested in studying the ways male and female teachers gave positive and negative feedback to male and female students.

She observed that both male and female teachers were involved in significantly more evaluative interactions with males, regardless of whether the feedback was work-related, or to do with the student's conduct. She found little difference in the way in which teachers used positive feedback with students of either sex, with the majority of it referring to intellectual competence. However, there were differences in the way negative feedback was used. While criticism generally referred to the intellectual qualities of females' work, males on the other hand received their negative feedback for both intellectual and nonintellectual aspects of their work, and for conduct. It appears therefore that the findings from this study greatly mirror those of Dweck and her colleagues, and that the same implications for students' subsequent failure attributions are relevant.

Neale found also that although female teachers gave more feedback to males, they still treated males and females in a relatively similar way. What differed was the way in which male teachers gave feedback. They tended to give significantly less evaluative feedback to females, and have overall a lot fewer interactions with them. When they did criticise females, it usually related directly to their intellectual competence.

#### **ATTRIBUTIONS AND THE SEX-APPROPRIATENESS OF THE TASK:**

Thus, although females' attributional biases have been depicted in many studies, there is some inconsistency in the evidence. This has led to many researchers now modifying their research question to "under what conditions do females evidence debilitating attributional biases?" (Stipek, 1984). The focus of much attributional research now considers that differences in attributions about performance outcomes,

and expectancies for future success and failure may vary not only between males and females, but also from task to task, most specifically, across school subjects (Maehr, 1980).

Licht and Dweck (1984) hypothesized that certain academic areas are more likely than others to pose difficulties at the start of new units. Thus, it follows that the necessity of surmounting difficulties will probably be easier for students of certain achievement orientations, namely mastery-oriented students. They proposed that Maths is a subject area where failures are common, as one is constantly confronted with new concepts and operations. In comparison, failures are less likely in verbal areas (such as English), as once the basic concepts are mastered, acquisition of new material is more piecemeal, with the difficulty level increasing gradually.

Consistent with their supposition, they found that Maths is more likely than verbal areas to involve failure and confusion when new material is introduced, and that "mastery-oriented", rather than "helpless" students learned more effectively in these situations.

As females are more likely to display a helpless achievement orientation than males, this seems a plausible explanation for why males often out-perform females in Maths. Additionally, a further implication of this work is that females will show less confidence in their Maths abilities than males, while no such differences will exist in their verbal abilities.

### *Masculine versus Feminine Tasks*

It may also be that school subjects differ in their perceived sex-appropriateness, resulting in differences in perceived ability. For the purpose of this thesis, a "masculine" task is defined as one on which males perform better on average than females, with the opposite being true on a perceived "feminine" task. Research has often shown that females have superior verbal skills in comparison to males (Maccoby & Jacklin, 1974; Ryckman & Peckman, 1987), and that males perform better in Maths achievement tasks (Fennema & Sherman, 1977), and that these actual differences in

performance are related to students' beliefs that various cognitive tasks favour one sex or the other (McMahan, 1976). It has been hypothesized that this has led to sex-role stereotyping of achievement domains, with Maths typically being seen as a masculine domain and English a more feminine domain (Dweck & Licht, 1980).

Weiner et al. (1971) began investigations into attributions following performance on sex-consistent and inconsistent tasks several years ago. Their initial studies showed that an expected outcome is readily attributed to the performer's ability (by an observer), while an outcome which is unexpected is more likely to be ascribed to chance or luck. Deaux and Emswiller (1974) concluded from this research that possibly an analogous argument can be made for the evaluation of performance by males and females in which expectations are sex-linked. That is, males and females will have low or high expectancies depending upon whether the task is considered predominately masculine or feminine. They hypothesized that when a task was sex-consistent, performance would be attributed to internal factors, such as ability. In comparison, chance would be a more common explanation for performance on a sex-inconsistent task.

Results of this study demonstrated that this was indeed the case. When the performer was male, and the task "masculine", performance was attributed to skill. Whereas, on the same task if the performer was now female, luck attributions were more frequently employed. However, the reverse was not true on feminine tasks. Contrary to what was predicted, under these conditions, both males and females were rated very similarly. Overall, independent of the task, males were considered more skilful, while females were seen as being luckier. Many other more recent studies have reached the same conclusion - that males make more egotistical attributions (i.e., internal attributions for success, and external attributions for failure) than females.

Stein, Pohly, and Mueller (1971) also carried out studies of this nature, concentrating on students' own expectations for success and failure. Results of their investigation indicated that when students were told that a task measured typically masculine or



feminine traits, high expectancies of success were predominant on sex-appropriate tasks, and low expectancies prevailed on sex-inappropriate tasks.

Rosenfield's (1976) studies yielded corresponding results. He argued that the different degrees of ego-involvement that males and females may have in the tasks could account for gender differences in males and females attributional patterns. If a task appears to be characteristically "masculine", it would be expected that males would be more ego-involved than females. Consequently, males would be more likely to take responsibility for their successes but blame their failures on elements out of their control. However, on a "feminine" task (i.e., ones which involve feminine traits) the opposite would be expected, with males attributing success less internally and failure less externally than females.

Results of this study found that again, males did make more egotistical attributions than females when the task was described as masculine, and on the feminine task females made more egotistical attributions than males. Thus, it is shown that females do not always attribute their successes less internally, or their failures more externally than males. Additionally, it appears that males and females do not vary in how egotistical they are, with attributions being dependent on a student's ego-involvement.

Parsons et al. (1982) also investigated the hypothesis that females were more likely exhibit self-derogating attributions in Maths than males. This study revealed no overall gender differences in students' self-concepts of Maths ability. Additionally, no significant differences were evident in males' and females' attributional patterns for success or failure. The only significant difference was that females, compared to males rated their expectations for future success slightly lower. Hence according to this investigation it would appear that females are not more learned helpless on Maths than males.

These trends have not been replicated across recent studies however. For example, Stipek (1984), found that females were more likely to exhibit helpless attributions on

tasks in which males are believed to be more competent (Maths). However, on tasks in which females are thought to be more competent (spelling), males did not evidence these same attributional biases, despite males actually achieving at a lower level than females.

Similarly, Gitelson, Petersen and Tobin-Richards (1982) examined students' expectancies of success, evaluations of performance, and attributions for success and failure for verbal and spatial tasks. Results showed that irrespective of the task, females expected to perform less well than males, although no sex differences in performance were found. For the spatial task, females attributed less ability to themselves than did males, and rated the task as more difficult. Females also evaluated their performance more negatively on this task. No such differences were found on the verbal task. Again, these results demonstrate that helpless achievement expectancies, evaluations and attributions on sex-inappropriate tasks exist for females but not for males.

A more recent study by Stipek and Gralinski (1991), which measured females' and males' achievement related beliefs in Maths, found that females rated their ability lower than did males, and also expected to perform less well on a Maths exam than did males. When females failed they were more likely to attribute it to a lack of ability, and were less likely to ascribe their success to high ability than males. Moreover, they employed more luck attributions when explaining their failures. Consequently, females also expressed a greater desire to avoid future Maths achievement situations, and held lower expectations for future performance in Maths. When asked about whether they believed success was achievable by hard work, females, less frequently than males, claimed that anyone could do well if they tried hard enough.

## ATTRIBUTIONS AND PERCEIVED COMPETENCE

One assumption of the attribution theory is that students' achievement behaviours are mediated by perceptions of ability. Ability perceptions have been shown as an important factor in determining achievement behaviour (e.g., Chapman, 1988; Eccles et al., 1984; Thomas, 1989). Students who believe that they are competent will be more likely to choose more difficult tasks, to choose achievement-related tasks, and to evidence more effort and persistence when faced with a difficult task, or lack of success. Alternatively, students with low perceptions of their abilities will expect failure and attribute this to low ability. They will choose tasks at which failure is highly likely, and performance is likely to be impaired (Stipek, 1988; Eccles et al., 1984). The literature indicates that people who believe they are competent are more confident in approaching achievement situations, have higher achievement-related expectancies, and consequently perform better on these tasks (Nicholls, 1980; Thomas, 1989).

That is, students who perceive themselves to be competent at a task are more likely to attribute success to their abilities, and failure to some other cause. Attributing success to internal factors, such as ability, is likely to result in favourable affective reactions, which serve to reinforce the person's perception of him/herself as competent, and also increase expectations of future success. The competent person who fails is likely to ascribe his/her failure to external factors such as luck or task ease, since it is an unexpected outcome and has a low expectancy for recurrence (Nicholls, 1980; Stipek, 1988; Weiner, 1979).

In contrast, students who do not believe they are competent will probably attribute failure to this lack of ability, and will explain success using other external factors. The student who has a low self-concept of ability tends to expect failure, so can readily attribute it to an internal factor. When success occurs unexpectedly, it will be attributed to external causes such as good luck and teacher assistance (Covington & Omelich, 1979; Erkut, 1983). Moreover, implicit in ascribing success to external factors, is low expectancies for future success. Failure, however, confirms the

student's belief that he/she is incompetent and lacks the prerequisite ability to achieve. Consequently continued failure is expected and achievement-related situations are avoided in future (Nicholls, 1980).

That males and females have different perceptions of their competence has been well documented already, with males generally perceiving themselves as more able than females, and having higher estimates of their performance and expectations for future success in achievement situations, despite there being little, if any, difference in actual performance (eg Deaux, 1976; Dweck & Goetz, 1978; Frieze et al., 1978; Parsons et al., 1982).

Research performed with New Zealand students has yielded a similar constellation of attributions and subsequent achievement-related behaviours. For example, in a study with middle-class students, Nicholls (1976, cited in Nicholls, 1980) found that again, despite females performing better than males on a reading task, and perceiving themselves as more competent, females attributed failure to lack of ability more frequently than did males. This led to the conclusion that even when females perform as well or better than males, and perceive themselves as doing so, they are still less likely to employ attributions that makes for continuing achievement behaviour. Another New Zealand investigation (Hunt, 1989) also found that females have lower perceived ability than males in Maths, but they had a slightly higher mean score on English perceived ability.

## CHAPTER 3

### THE PRESENT STUDY

#### RECAPITULATION AND HYPOTHESES

Gender differences in cognitive performance have been documented extensively, with males consistently performing at a higher level on measures of spatial ability, and females on measures of verbal ability. There has been much research into potential mechanisms which could account for these differences. Of particular interest in the present study are several of the social factors which have been hypothesized to mediate gender related differences in intellectual performance, including expectancies of success, perceived competence, the sex-appropriateness of the task and attributions made about success and failure.

Much available literature reports that females show greater evidence of learned helplessness than males in achievement situations. The present investigation seeks to explain gender differences in attributions and expectations as a function of the way in which teachers interact with their students. Focusing on the nature of evaluative feedback given by teachers to their students after academic responses, the links between teacher behaviour and students' cognitive responses to success and failure will be explored. It is hypothesized that males and females are being treated differently in the classroom, which in some way affects their cognitions in achievement situations, and subsequent achievement behaviour.

The present investigation will consist of two major parts - the first being an observational study (loosely following the format of Dweck et al., 1978), and the second being in the form of a questionnaire.

## PART ONE - OBSERVATIONAL STUDY

Although this type of study has been carried out already in New Zealand, only the sex of the evaluator has been manipulated, and not the subject being studied. Considering the evidence from studies quoted on differential effects of male and female teachers, it would appear logical to include sex of the evaluator as a predictor of students' attributions. However, while the present study acknowledges the importance of this variable, practical constraints meant that all teachers observed in this study, regardless of the subject being taught, were male. Male teachers, rather than female teachers, were chosen as they predominated in the teaching of Maths and English classes. By keeping this variable constant, it cannot be argued that any significant results are a function of the evaluator's sex.

Dweck and Licht (1980) suggest that subject areas may differ in the degree to which persistence after failure is necessary for success. Given that females respond in a more debilitating way following failure, it is likely that they would perform most poorly in those subject areas where they are left with little choice but to view failure feedback as a condemnation of their ability, such as in subjects which emphasize intellectual competence and correctness, and where little evaluation is given for the nonintellectual quality of their work.

In contrast, this same pattern of feedback might acquire a different meaning for males, given their feedback history with teachers. To them, increased criticism would not necessarily imply a lack of ability, but instead be viewed as reflecting the teachers' negative attitude towards them. Therefore subsequent performance should not be adversely affected in the same ways that of females is. It is more likely that males would evidence debilitated performance in subjects where nonintellectual aspects of work are emphasized (Dweck & Licht, 1980).

In Maths, in contrast to English, there is a stronger emphasis on intellectual work aspects, errors are likely to be more frequent and highly salient, and the criteria for success in Maths is more objective than in verbal areas (Dweck & Licht, 1980).

Thus the majority of evaluation given to students would pertain to intellectually relevant aspects of their work, suggesting that criticism given to females is even more likely than usual to be interpreted as a lack of competence. In English, while intellectual qualities are still important, a student is able to compensate for perceived intellectual inadequacies by improving some other quality of their work (e.g., spelling, grammar, imaginative ideas), as the criteria for success is more ambiguous.

Given that females are shown to be more debilitated in Maths than English, it is the prediction of the present study that evaluative feedback in these subjects may differ in several qualitative and quantitative ways, which may subsequently seriously and adversely inhibit females' learning in a traditionally "masculine" domain.

## **GENDER DIFFERENCES IN FEEDBACK**

### **QUESTION**

Are there gender differences in the nature and frequency of feedback received by students?

### **HYPOTHESES**

- 1.1 That males and females will not differ in the amount of overall feedback they receive.
- 1.2 That males, compared with females, will receive more negative feedback.
- 1.3 That females, compared with males, will receive more positive feedback.
- 1.4 That males, compared with females, will receive a greater amount of feedback for nonintellectual aspects of work, and conduct.

1.5 That males and females will not differ in the total amount of feedback they receive for intellectual aspects of their work.

1.6 That males, compared with females, will receive more positive feedback for the intellectual qualities of their performance (i.e., females will receive more positive feedback for intellectually irrelevant work aspects).

1.7 That negative feedback given to females will be primarily for intellectual inadequacies in their performance.

1.8 That negative feedback given to males will refer little to the intellectual quality of their work, but instead refer to conduct, and the nonintellectual aspects of their work as well.

1.9 That positive and negative feedback given to males is more diffuse and ambiguous in its referents than with females, who will receive more specific feedback.

## **GENDER DIFFERENCES IN FEEDBACK IN MATHS AND ENGLISH**

### **QUESTION**

Are there gender differences in the nature and type of feedback received by students in Maths and English?

### **HYPOTHESES**

1.11 That males and females will not differ in the amount of overall feedback they receive in Maths and English.



1.12 That males, compared with females, will receive more negative feedback in Maths.

1.13 That females, compared with males, will receive more positive feedback in Maths.

1.14 That males and females will not differ in the total amount of feedback they receive for intellectual aspects of their work in Maths and English.

1.15 That females, compared with males, will receive less feedback for nonintellectual aspects of their work, and conduct in Maths.

1.16 That females, compared with males, will receive less positive feedback for the intellectual qualities of their performance, in Maths than English (i.e., females will receive more positive feedback for intellectually irrelevant work aspects).

1.17 That negative feedback given to females will refer predominantly to the intellectual quality of their work, and little to conduct or the nonintellectual aspects of their work in Maths.

1.18 That negative feedback given to females, compared with males, is more specific in its referents, in Maths than English.

1.19 That positive feedback given to females, compared with males, is more diffuse and ambiguous in its referents, in Maths than English.

The first part of this study investigated the patterns of evaluative feedback given to males and females in the Maths and English classrooms. The purpose of the second part of the study is to attempt to explain gender differences in achievement by examining gender differences in students' attributions and expectations in these subjects. Subsequent discussion will then include speculation into potential links

between teachers' appraisals following academic responses, and students' cognitive and behavioural responses to success and failure.

## PART TWO - ATTRIBUTION QUESTIONNAIRE

Much educational literature documents the dramatic effects failure can have on performance. It has been extensively illustrated that there are marked differences among students in the way they respond to failure in achievement situations. For some students, these effects are positive and lead to increased effort and intensified concentration. Persistence is increased, and problem-solving strategies become more sophisticated, resulting in enhanced overall performance. For other students, however failure has a different meaning, and many of the above consequences are reversed. For these students, failure leads to a reduction in effort, the deterioration of strategies, and performance is severely disrupted. Moreover, these students often are unable to complete tasks they had previously been able to accomplish with ease (Dweck & Licht, 1980).

Although the behaviour of these two groups preceding failure is very similar, once failure occurs, vastly different consequences become apparent. Much research shows that these two groups start out with virtually identical performance - equivalent speed, accuracy, and sophistication of problem solving strategies, as well as similar intelligence levels. It is the proposition of this thesis that what distinguishes these two groups, are their cognitions following success and failure.

There is considerable evidence which indicates that students' perceptions of the cause of achievement-related events have important implications for their subsequent affective responses, expectations for success and failure, self-esteem, achievement-related behaviour, and essentially, their performance in ensuing achievement situations (Dweck & Goetz, 1978; Weiner, 1979).

Much research reports gender differences in achievement related attributions and

behaviours. Females have often been observed to be more helpless than males in achievement situations, even on tasks at which they have clearly demonstrated their ability, or in areas in which they have clearly out performed males. This often results in females predicting lower grades for themselves, or poorer performance on novel tasks, and avoid tasks that pose a challenge.

It is evident that New Zealand data on gender differences in attributions for success and failure is sparse. Moreover, the studies that are available yield equivocal, and often contradictory results. It has been suggested that inconsistent findings across studies may be a function of the instrumentation used to collect attributional data. Most studies have employed structured questionnaires, based on rating scales, and measured attributions by presenting subjects with experimenter-defined achievement tasks.

The design of the investigation reported in this thesis attempted to take these factors into consideration. Attributions were measured in a natural achievement setting, the classroom. The questionnaire used to obtain students' causal reasons for success and failure required students to locate causes on an interval scale for each of the three dimensions (stability, controllability, and locus) themselves, rather than have the researcher assign the causes to the dimensions. Also, to avoid forcing students to attribute outcomes to factors which may not be perceived as the most salient, the attribution question required subjects to generate their own reasons for being successful or failing.

It has been shown also that students' causal attributions for achievement outcomes are reliable predictors of their responses to success and failure and subsequent achievement behaviour. However, it is apparent that this relationship is mediated by several factors. It has been suggested that the perceived sex-linkage of the task is a crucial mediator of students' expectations and attributions, with both males and females expectancies for success being greatest on sex-appropriate tasks.

Results of sex-typed studies demonstrate that females perceive Maths as an "un-feminine" choice, and at a time when they are self-conscious about making gender-inappropriate choices, they decide not to continue with Maths (Megarry, 1984).

Following from these studies, the present investigation assumed that both males and females would stereotype Maths as predominantly a "masculine" subject, and view English as more appropriate for females to study. It appears that males and females have differential academic attitudes and values, resulting from different intellectual demands, instructional activities and socialisation experiences in Maths compared to verbal areas (Jacklin, 1989).

It was hypothesized that there would be gender differences in students' achievement behaviour and cognitions, following success and failure in Maths and English, not only because these subjects have typically been sex-typed, but also due to characteristics of the subjects which differentially appeal to males and females. Licht and Dweck (1984) suggest that these subject areas differ in the degree to which one must persist after failure to achieve success, with mathematical areas possessing qualities least suited to females, and verbal areas having qualities which render them least attractive to males.

Gender differences in perceived ability, as a moderating variable, have also received considerable attention. Research suggests that regardless of actual performance, males, in comparison to females, believe they are more able. Thus, the present research advances the view that considering the general belief in greater male competence, if a task is perceived as masculine, there will be significant gender differences in expectations and attributions. However, on a feminine task, males will have lower perceptions of competence, and expectancies of success, than on a masculine task. These lowered expectancies, when combined with the more general belief in male competence, are predicted to produce little or no overall gender differences in expectations and attributions on feminine tasks.

Another factor which is hypothesized to contribute to the gender differences in Maths is the role of effort in success. There is some evidence in learned helplessness literature which suggests that males, in comparison to females, place more

importance on the role of effort, and other motivational factors, for success (Stipek, 1991). As females generally believe themselves to be harder working than males (Dweck, Goetz & Strauss, 1980), they may believe that success in Maths is less obtainable through effort than males do. Thus it is probable that females will try to avoid Maths achievement situations more than males, and they will exert less effort on Maths related activities, as increased effort is not expected to result in success. Little attributional research has included these factors when discussing gender differences in causal reasoning (Stipek, 1991), hence, the present study will assess males and females beliefs that success can be achieved through effort, and their desire to avoid achievement situations, in both Maths and English.

## **GENDER DIFFERENCES IN ATTRIBUTIONS**

### **QUESTIONS**

Do males and females use different causal attributions for success and failure?

### **HYPOTHESES**

2.1 Females are predicted to attribute success to external, unstable, uncontrollable causes, and failure to internal, stable, uncontrollable causes. Males will evidence the opposite attributional pattern, attributing success to internal, stable, and controllable causes, and failure to external, unstable and controllable causes.

## **GENDER DIFFERENCES IN MASTERY AND LEARNED HELPLESSNESS**

### **QUESTIONS**

Do females develop learned helplessness more readily than males?

Are learned helpless and mastery attributional patterns related to perceptions of competence, avoidance behaviours, and expectations for future performance?

### **HYPOTHESES**

2.2 Females, in comparison with males, are predicted to make learned helpless attributions for success and failure.

2.3 Mastery-oriented attributions will be related to high perceptions of competence, high expectations for future success, and a low desire to avoid future achievement-related situations. Learned helpless attributions will be related to low perceptions of competence, low expectations for future success, and a high desire to avoid future achievement-related situations.

## **GENDER DIFFERENCES IN PERCEIVED COMPETENCE**

### **QUESTIONS**

Do males perceive themselves to be more competent than females?

Are perceptions of competence related to expectations and attributions?

### **HYPOTHESES**

2.4 Males, in comparison to females, will perceive themselves as more competent.

2.5 Regardless of a student's sex, high perceptions of competence will be related to high expectations for future performance, the perception that the task is relatively easy, low avoidance desires, expending a lot of effort on the task, and the belief that success is obtainable through effort. Low perceptions of competence will yield the opposite pattern of achievement-related beliefs.

## **SEX-CONSISTENT VERSUS SEX-INCONSISTENT TASKS**

### **QUESTIONS**

Do students perceive Maths as a "masculine" subject and English as a "feminine" subject?

Do students' attributions for success and failure depend on the perceived sex-appropriateness of the task?

Are there gender differences in perceived competence on a sex-consistent task versus a sex-inconsistent task?

Are there gender differences in expectations for future performance on a sex-consistent versus a sex-inconsistent task?

Are there gender differences in desire to avoid a sex-inconsistent versus a sex-consistent task?

Are there gender differences in how hard students try on a sex-consistent versus a sex-inconsistent task?

Are there gender differences in perceived task difficulty on a sex-consistent versus a sex-inconsistent task?

Are there gender differences in students' beliefs that success can be achieved through effort on a sex-consistent versus a sex-inconsistent task?

## HYPOTHESES

2.6 Both males and females will perceive Maths as predominantly a "masculine" subject and English as a "feminine" subject.

2.7 Females, in comparison with males will make more helpless attributions in Maths. No such differences are expected in English.

2.8 Females, in comparison with males are predicted to have lower perceptions of competence in Maths, and lower expectations for success. No such differences are expected in English.

2.9 Females, in comparison with males are predicted to expect to do less well in future in Maths. No such differences are expected in English.

2.10 Females, in comparison with males are predicted to express a stronger desire to avoid Maths performance situations in future. No such differences are expected in English.

2.11 Females, in comparison with males are predicted to not try as hard in Maths. No such differences were expected in English.

2.12 Females, in comparison with males are predicted to rate Maths as more difficult than English.

2.13 Females, in comparison with males are predicted to believe that success can not readily be achieved through effort in Maths. No such differences are expected in English.



## CHAPTER 4

### METHOD

#### OVERVIEW AND DESIGN

The present investigation comprised two parts. The first assessed the nature and frequency of evaluative feedback received by males and females in the classroom, following a format similar to that used by Dweck et al. (1978). Four classrooms - two English, and two Maths, all taught by male teachers, were observed for a total of five hours each.

The second part of the study used a questionnaire to measure students' attributions for success and failure, their perceptions of competence, evaluations of the difficulty of the task, expectations for future performance, avoidance behaviour, and the perceived sex-appropriateness of the subject (Maths or English) in question.

#### SUBJECTS

Subjects comprised 97 Form Five students who took at least either Maths or English. Of this sample 50 were male and 47 female. Their ages ranged from 15 to 17 years old. 80.4% considered themselves to be European, 11.3% Maori or Polynesian, and 3.1% Other. 5 students did not indicate ethnicity. 12.3% of 1991 New Zealand School Certificate Candidates were Maori (Department of Education, 1991). Thus, in terms of age, sex, and ethnicity, the present sample was considered representative of the population being studied.

All participating students a co-educational school in the lower North Island. Two Maths classes and two English classes were involved in the study. Although the college had "extension" classes for both Maths and English, consisting of the highest

achieving 25 to 30 students in each subject, the classrooms involved in the present investigation were all mixed-ability classes. In total, 53 students studying Maths, and 44 students studying English were included in the second part of the study. As all classrooms were observed every day for one week, the number of students present in a particular class on any day varied according to absentees, thus exact numbers of students involved in the observation study can only be estimated, but were not dissimilar to those figures already quoted.

## INSTRUMENTS

### DEVELOPMENT OF ATTRIBUTION QUESTIONNAIRE

This questionnaire was used to assess students' perceptions of competence, task difficulty, expectations for future success, wish to avoid future achievement-related situations, whether they believed success could be achieved through effort, and the sex-appropriateness of the task. In addition, the questionnaire measured students' causal attributions for both success and failure, and the location of these attributions on the dimensions of stability, controllability, and locus (see Appendix 1).

The first part of the questionnaire asked subjects to answer four questions pertaining to how competent they were in the subject, how hard they tried in the subject, and how hard they perceived the subject to be. Questions 1, 2, and 4 were adapted from Stipek (1991), with some minor variations in wording, for example "how good are you at Maths compared to your classmates" (rated on a 5-point scale ranging from 1 = much worse to 5 = much better, was changed to "what percentage of students in your class do you think are better than you" (ranging from 0-20% to 80-100%).

Next, subjects were asked to think of times when they did well in the subject, and to list the three most important reasons why this might have been so. They were then asked to locate the most important reason for doing well on the dimensions of stability, controllability, and locus (after Forsyth & MacMillan, 1981).

Subjects were presented with a five point Likert-type scale for each dimension, with the extremes of the dimension at either end, for example, for the dimension of stability, 1 = something you can control and 5 = something you can't control. In order to aid interpretability of the dimensions, and minimize ambiguity, each was explained with reference to aspects of students' experiences; for example "if 1 = something that you can control, like who your friends are, and 5 = something you can't control, like the weather" (after Loveridge, 1986). However, instead of the 5-point scales used by Loveridge, it was decided to employ 6-point scales for the present study, since the emphasis of the study is on how students themselves interpret their attributions for success and failure, and not the actual attribution itself. It was thought that a 5-point scale may encourage too many midpoint ratings, which provide little information about the meaning of the attribution.

On completion of this, subjects were asked to repeat the above procedure, but this time thinking of times when they didn't do well in the subject. Again the most important reason for not doing well was rated on the dimensions of stability, controllability and locus.

The next part of the questionnaire included two questions pertaining to students' expectations for success in the future (again measured on a 5 point scale). Following this were two questions concerning students' desire to avoid Maths/English achievement situations, and two questions assessing students' beliefs about whether success in the subject could be achieved through effort. The latter four questions were also measured on 5-point rating scales and were taken from Stipek (1991).

The final part of the questionnaire asked subjects first to rate which sex they believed to be better at the subject in their class - males or females (on a 5-point scale). Then, bearing in mind that there are some subjects that people consider as more suitable for females, and other subjects more suitable for males, subjects were requested to indicate on a 5-point scale, ranging from more suitable for females to more suitable for males, where they thought Maths/English would be.

The finished questionnaires for Maths and English were identical, except for one minor alteration in the wording of question 14. The original question, as it appears in the Maths questionnaire reads "Are you going to take Maths next year?"

Following the pilot study it was discovered that it is compulsory to take English in the sixth form at Wairarapa College, so question 14 was changed to "Although it is compulsory for you to take 6th form English at Wairarapa College, if you had the choice would you take English next year?"

### OBSERVATION SCHEDULE

The observation schedule consisted of seven categories, not dissimilar to several of those employed by Dweck et al. (1978), to reflect different aspects of teacher-student interactions (see Appendix 2). The primary focus was on the nature and frequency of evaluative feedback received by the students from their teachers, specifically concentrating on feedback which concerned their conduct or academic performance. The schedule allowed for every instance of evaluative feedback to be coded and analyzed in relation to the sex of the student, and the subject (Maths or English) being studied.

The observation schedule included the following categories:

1. SEX/CLASS - whether the recipient of the feedback was male or female, or whether it was a comment made to the whole class.
2. SUCCESS/FAILURE - whether the student had responded correctly or not.
3. POSITIVE/NEGATIVE/ABSENT - whether the feedback was of a positive or negative nature. Absence of feedback following teachers' appraisal of performance was also included.

4. **CONDUCT** - this category included evaluative feedback given for misbehaviour, for example, not sitting still, talking, forgetting equipment/books.

5. **WORK-RELATED FEEDBACK** - any comment related to the students's work, be it intellectual or non-intellectual.

a) Intellectual feedback - an evaluative comment contingent upon the intellectual quality or correctness of the student's performance or class work.

b) Non-intellectual feedback - an evaluative comment contingent on a non-intellectual aspect of the student's performance eg. neatness, instruction following, format, order etc.

6. **GENERAL/SPECIFIC** - whether the feedback could be classified as ambiguous and diffuse, or specific. i.e., how related it was to the student's work.

### **PILOT STUDY**

The questionnaire was trialed on 20 Form Five students (10 studying Maths and 10 studying English) from the College, who were not involved in the final study, and were considered by their teachers to represent the range of abilities found in most classrooms. Students were both male and female, and of a similar age to those in the population being studied. The time taken to complete the questionnaire ranged between 10 and 25 minutes. After completion of the questionnaire, students were asked if there was anything which had been difficult to understand, if they understood the instructions and questions completely, and if there were any items they thought had been missed out that should have been included.

Based on students' feedback, a few alterations to the questionnaire were made. On the original questionnaire, question 17 (which required subjects to agree or disagree with two contradictory statements, where agreeing with one logically meant disagreeing with the other), only gave subjects the chance either to agree or disagree.

However, several subjects were answering these questions inconsistently, i.e., agreeing or disagreeing with both statements. Thus, in the revised questionnaire, subjects were provided with 5-point rating scales for both questions, where 1 = strongly agree and 5 = strongly disagree.

Another alteration to the original questionnaire was the inclusion of a further question on the perceived sex-appropriateness of the task. Nearly every student in the pilot study, regardless of whether they were studying Maths or English, responded that they did not consider the subject more suitable for either sex (i.e., circled 3 on a 5-point scale). From concern that this question might not be tapping adequately the issue of sex-appropriateness, the following question was added "In your class, who do you think are better at Maths/English?", answered on a 5-point rating scale, anchored with males = 1, and females = 5. The reason for rating this question on a 5-point scale was that students were consistently circling both males and females, or writing "neither" to indicate that they believed the subject to be equally suitable for both sexes. By providing students with a scale, they could indicate different degrees of masculinity or femininity, or neutrality.

### OBSERVER TRAINING

For the observational study a second, independent observer was used in order to assess the accuracy of the obtained observations. The "co-observer" was a second year psychology student, who was well versed in behavioural observation techniques. Approximately two weeks prior to the study, the co-observer and myself spent several hours observing and coding in the classrooms that were to be involved in the actual study (in order to accustomize both students and teachers to our presence). Any problems of classification were written down in full and then discussed to clarify the appropriate coding.

After a short period of time, it became evident that the original observational form needed revision, and further discussion was required to clarify the nature of feedback

which should be included in each category, as inter-rater reliabilities were low (around 60%). In order to assess accuracy of the observations, interval recording was used. This method requires that continuous time intervals be observed, and the recorder notes whether or not a specified behaviour (or part of a behaviour) occurs within that interval. If more than one behavioural episode occurs, it is still recorded as if only one episode had occurred (Millar, 1980).

Inter-rater reliabilities were calculated at the beginning of the study, half way through the study, and at the end of the study, using the following formula:

$$\frac{\text{number of agreements}}{\text{number of agreements} + \text{number of disagreements}}$$

Using this formula, reliabilities of between 82% and 90% were calculated, with an average agreement of 87%.

## PROCEDURE

In April 1992, the principal of the participating College was sent a letter, requesting permission to carry out the present study at the school. The nature of the study was outlined, and the pilot form of the questionnaire attached. On agreement, a time convenient to all parties involved (principal, teachers and researcher) was then arranged.

## INTRODUCTION OF STUDY TO STUDENTS

At the beginning of the study, I introduced myself to each of the classrooms involved, and the purpose of the research was outlined. All students were informed that *"I am conducting a study on how fifth form students feel about Maths/English, and am interested in seeing what sort of things you do in Maths/English now. This means I will come to this class all week and just sit down the back and listen to what's going on. You'll probably notice that I'll take some notes too. At the end of the week I'll probably ask you to fill in a questionnaire for me"*. It was stressed that participation in the study was voluntary, and that all results were confidential, with myself being the only person who would see them. All students agreed to participate. Students were also now given a letter to take home to their caregivers so that both them and the student would have a written account of the nature of the study, what it involved, and what would be required of them (see Appendix 3).

## CLASSROOM OBSERVATION

The classroom observation study was completed first, so as not to influence behaviour, which administering the questionnaire first might have done.

Observations were carried out over a period of one week (10-14 August). Each of the four classrooms were observed for a total of five hours. All observed instances of evaluative feedback given by teachers to students were coded according to the above schedule.



During the observations, the co-observer (where applicable), and the researcher sat in an unobtrusive part of the classroom, which afforded an unobstructed view of the teacher and student, and allowed (nearly) all interaction between them to be clearly heard.

### QUESTIONNAIRE ADMINISTRATION

At the end of the week, questionnaires were administered to all students. All questionnaires were administered by the researcher, and written instructions were provided to ensure standardised administration (see Appendix 4). Before administration of the questionnaire, students were reminded again of the purpose of the study, and what sort of questions they would be required to answer. It was explained to them that their answers were absolutely confidential, and that the researcher was the only person who would see them. Students were also told why a study of this nature is important, and the necessity that they answer all questions as honestly as possible. Again, voluntary participation was stressed, however, no-one declined to take part. These points were also reiterated on the questionnaire itself. Students were also requested to fill in the consent form on the front of the questionnaire (see Appendix 5). Before receiving the questionnaire, students were given the opportunity to ask any questions to ensure all instructions were clearly understood. Administration time was between 20 and 30 minutes per class.

## SUMMARY OF PROCEDURE

1. April 1992. Principal of College approached regarding participation in the study.
2. July 29. Pilot study.
3. August 10-14. Observational study of two Maths classrooms and two English classrooms.
4. August 14. Questionnaires administered to all participating students.
5. September 2. Letter sent to thank School for participating.
6. March 1993. Feedback to College regarding the results of the study.

## CHAPTER 4

### RESULTS

#### SECTION A: OBSERVATIONAL STUDY

Data pertaining to hypotheses in the observational study were analyzed predominately using 2 x 2 crosstabulations to determine first the gender differences, and subsequently, the gender differences in Maths and English, in the nature and frequency of feedback given to students. The significance of relationships between variables were initially evaluated using chi-square statistics. Individual cell differences were then measured using a series of one-tailed t-tests.

#### OVERALL FEEDBACK

The first hypothesis in this section compared the total amount of feedback (both conduct and work related) received by males and females. Contrary to what was predicted, it was found that males received more feedback (50%) than females (40%) overall. Additionally, the class as a group received 10% of the total feedback. However, feedback given to the class was not included in ensuing analyses since the focus of the present research study was gender differences in evaluative feedback.

#### POSITIVE, NEGATIVE AND ABSENT FEEDBACK

The proportion of total feedback that was negative and positive was analyzed first. As expected, there were significant differences in the amount of positive, negative, and absent feedback given to males and females,  $X^2(4, N = 462) = 87.00, p < .001$ .

### *Negative Feedback*

It was expected that males, compared with females would receive more negative feedback. As demonstrated by data displayed in Table 4, it is evident that males did receive a great deal more negative feedback overall (51%) than females (29%). This difference was significant,  $t(44) = 4.05$ ,  $p < .001$ .

**Table 4**

*Percentages of Negative and Positive Feedback Given to Males and Females.*

	Males	Females
N	230	186
Positive	47	62
Negative	52	29
Absent	1	9

### *Positive Feedback*

Hypothesis 1.3 predicted that females would receive more positive feedback than males. Data presented in Table 4 indicates that although this was in fact the case, the size of the difference was not significant.

### *Absent Feedback*

Absent feedback refers to evaluation which was absent following a student's performance. It is noteworthy that teachers failed to respond to male students only 1% of the time, whereas feedback was not given to females 9% of the time. This result was significant,  $t(190) = -4.97$ ,  $p < .001$ .

## CONDUCT, INTELLECTUAL AND NONINTELLECTUAL FEEDBACK

Males and females were also compared on the percentage of teacher's evaluations which were related to conduct, evaluations which were contingent upon intellectual aspects of the task i.e., competence or correctness (intellectual feedback), and evaluations which were contingent upon nonintellectual aspects of the task e.g., neatness, instruction following, speaking clearly (nonintellectual feedback). Results of initial analyses indicate that there were significant differences in the reasons why males and females received evaluative feedback,  $X^2(4, N = 462) = 115.90, p < .001$ .

### *Nonintellectual and Conduct Feedback*

As anticipated by hypothesis 1.4, males received twice as much feedback for conduct (28%) than females (15%). Additionally, males received 17% of their feedback for nonintellectual aspects of the task, compared with females who received only 8% of their evaluations for this reason (see Table 5). Results of a one-tailed t-test indicate that there were no significant gender differences between the amount of intellectually relevant and intellectually irrelevant (conduct + nonintellectual) feedback however.

**Table 5**

*Percentages of Intellectual, Nonintellectual and Conduct Feedback by Gender.*

	Males	Females
N	230	186
Intellectual	55	77
Nonintellectual	17	8
Conduct	28	15

### *Intellectual Feedback*

Hypothesis 1.5 predicted that males and females would not differ in the total amount of feedback they received for the intellectual quality of their work, regardless of whether it was negative or positive or absent. It is clear from the data presented in Table 5 that this was not the case. Whereas other studies found that males and females received similar amounts of intellectual feedback, the present study discovered the opposite to be true and correctness and competence feedback given to males and females differed quite markedly. Females received 77% of their total feedback for intellectual aspects of their work, whereas only 55% of males total feedback was addressed specifically to the intellectual quality of their performance. this difference was significant  $t(272) = 1.99, p < .05$ .

## **POSITIVE AND NEGATIVE, AND ABSENT FEEDBACK CONTINGENT ON INTELLECTUAL, AND NONINTELLECTUAL ASPECTS OF WORK, AND CONDUCT**

### Intellectual Feedback

Further gender differences in the nature and frequency of evaluation delivered to students is evident, when positive, negative and absent feedback is simultaneously analyzed with intellectual, nonintellectual, and conduct feedback. When positive and negative feedback contingent on intellectual aspects of the task is considered in the context of all evaluations received by students, (i.e., feedback for intellectual aspects/ feedback for intellectual aspects + feedback for nonintellectual aspects + feedback for conduct), interesting gender differences are apparent.

### *Positive Feedback*

Hypothesis 1.6 suggested that males would receive more of their positive feedback for correctness and competence, than females. However, for females 99%, of all the positive feedback they received was addressed specifically to intellectual aspects of their work. In comparison, males received 97% of their positive, feedback for the

intellectual quality of their work (see Table 6). These results are inconsistent with findings in other studies which found that males received more positive feedback for the intellectual quality of their work, than females.

### *Negative Feedback*

There were also slight discrepancies in the way negative feedback was used,  $X^2(4, N = 22.25, p < .001$ . Only 17% of males' negative evaluation was contingent upon intellectual aspects of their work, whereas a quarter of the criticism given to females was directed to the quality of their performance. This difference was not significant however.

### *Absent Feedback*

It is noteworthy that in all instances where teachers failed to respond to females, it was for intellectual aspects of their work. In contrast, nearly one third of males' absent evaluation followed intellectually irrelevant behaviours.

**Table 6**

***Percentages of Negative, Positive, and Absent Feedback Given for Conduct, Intellectual and Nonintellectual Activities by Gender.***

	Positive		Negative		Absent	
	M	F	M	F	M	F
N	109	115	118	54	3	17
Intellectual	97	99	17	24	67	100
Nonintellectual	3	1	30	26	33	0
Conduct	0	0	53	50	0	0

### Nonintellectual Feedback

#### *Positive Feedback*

Hypothesis 1.6 proposed that females would receive more positive evaluation for the nonintellectual quality of their work than males. Data in Table 6 shows that contrary to this hypothesis, there was no significant difference in the amount of praise given to males and females for intellectually irrelevant work aspects.

#### *Negative Feedback*

It was expected that males would receive more negative evaluation for nonintellectual aspects of work, than females. Data in Table 6 indicates also that there was a small difference in the frequency of negative nonintellectual feedback was administered to males and females, but again, this difference was not significant.

### Conduct Feedback

#### *Negative Feedback*

Hypothesis 1.9 stated that negative feedback given to males would refer little to the intellectual quality of their work, but instead to conduct and nonintellectual aspects of their work. It is apparent from this table also that for both males and females, over 75% of the criticism teachers gave to students was unrelated to its intellectual quality. For both males and females the majority of their negative feedback addressed primarily their conduct.

#### *Positive Feedback*

Also important is that regardless of a student's sex, positive feedback was never given for conduct.



## GENERAL AND SPECIFIC FEEDBACK

It was suggested that there would be gender differences in the specificity of feedback given to students. Initial crosstabulations revealed that this was the case  $X^2(2, N = 422) = 12.6, p < .001$ .

### *Negative Feedback*

It was anticipated that negative feedback given to males would be more ambiguous in its referents than with females. Looking at Table 7 it is evident that hypothesis 1.9 was supported, with 37% of the negative feedback given to males being considered diffuse, compared with 14% for females. This result was significant,  $t(376) = 2.12, p < .05$ .

### *Positive Feedback*

The final hypothesis in this section predicted that positive evaluation given to females would be more specific in its referents than with males. Data presented in Table 7 reveals that contrary to expectations, males received slightly more specific positive feedback than females.

**Table 7**

*Percentages of Specific vs General Negative and Positive Feedback by Gender.*

	Males		Females	
Feedback	Positive	Negative	Positive	Negative
N	108	102	110	50
Specific	91	63	85	86
General	9	37	15	14

## GENDER DIFFERENCES IN FEEDBACK IN MATHS AND ENGLISH

### *Overall Feedback*

Males and females were compared on the total amount of feedback they received in Maths and English. As predicted, there were no significant gender differences in the amount of overall (both positive and negative) evaluation students were given in these two subjects. Interesting however, is that English teachers gave nearly twice as much feedback to both males and females as Maths teachers.

### POSITIVE, NEGATIVE AND ABSENT FEEDBACK

Initial chi-square analyses revealed that there were significant differences in the proportions of positive, negative, and absent feedback was given to males and females in English  $X^2(4, N = 296) = 55.28, p < .001$ , and in Maths  $X^2(4, N = 166) = 36.32, p < .001$ .

### *Negative Feedback*

The data presented in Table 8 provides the necessary information to test hypothesis 1.12. This table clearly displays that contrary to what was predicted, males did not receive significantly more negative feedback in Maths than females. Interestingly, although no predictions were made pertaining to gender differences in feedback in English, males received almost twice as much negative evaluation, than females. This difference was significant,  $t(250) = 4.01, p < .001$ .

**Table 8***Percentages of Negative and Positive Feedback Received by Subject and Gender*

	Maths		English	
	Males	Females	Males	Females
N	80	66	150	120
Positive	61	70	40	58
Negative	39	27	58	30
Absent	0	3	2	12

*Positive Feedback*

Hypothesis 1.13 suggested that males, in comparison to females, would receive more negative evaluation in Maths. Consistent with this prediction, 39% of the feedback males received in Maths was negative. In contrast, only 27% of the evaluations males were given in Maths was positive. This difference was significant,  $t(255) = 4.17$ ,  $p < .001$ . Again, although not hypothesized, females received more praise in English than males.

*Absent Feedback*

Although very little absent feedback was observed, it is interesting to see that females consistently receive more absent feedback than males, regardless of the subject being studied. These differences were most pronounced in English, compared with Maths.

## INTELLECTUAL, NONINTELLECTUAL, AND CONDUCT FEEDBACK

Crosstabulations showed significant gender differences in the nature of feedback given to students in Maths  $X^2(4, N = 166) = 64.34, p < .001$ , and in English  $X^2(4, N = 296) = 61.64, p < .001$ .

### *Intellectual Feedback*

Hypothesis 1.14 predicted that males and females would not differ in the amount of feedback they received for competence and correctness in either Maths or English. Although this was the case in Maths, data in Table 9 shows that contrary to this hypothesis, females received a greater proportion of intellectual feedback than males, in English. Seventy-five percent of their total feedback in English referred to the intellectual quality of their work, compared with males, who received only 46% of their evaluation for this reason. This difference was significant,  $t(223) = 4.14, p < .001$ .

**Table 9**

*Percentage of Total Feedback Contingent Upon Intellectual and Nonintellectual Work aspects, and Conduct by Subject and Gender.*

	Maths		English	
	Males	Females	Males	Females
N	80	66	150	120
Intellectual	74	82	46	75
Nonintellectual	7	5	22	10
Conduct	19	13	32	15

*Nonintellectual and Conduct Feedback*

Hypothesis 1.15 predicted that females, compared with males would receive less feedback for nonintellectual aspects of their work, and conduct in Maths. As evident from data presented Table 9, this was not supported, as males and females received similar proportions of their total evaluation for intellectually irrelevant aspects of their work, and conduct, in both Maths and English.

**POSITIVE, NEGATIVE, AND ABSENT FEEDBACK CONTINGENT ON INTELLECTUAL AND NONINTELLECTUAL ASPECTS OF WORK AND CONDUCT IN MATHS AND ENGLISH**

*Positive Feedback*

According to hypothesis 1.16, females, compared to males, will receive more positive evaluation for nonintellectual aspects of their work in Maths than English. It can be seen from the data in Table 10 that although this was the case, differences were only slight. Interestingly, regardless of the subject being studied, males received absolutely no praise for nonintellectual aspects of their work, or conduct.

**Table 10**  
*Percentages of Positive Feedback Contingent on Intellectual and Nonintellectual Work Aspects, and Conduct by Subject and gender.*

	Maths		English	
	Males	Females	Males	Females
N	49	46	60	69
Intellectual	100	100	95	99
Nonintellectual	0	0	5	1
Conduct	0	0	0	0

*Negative Feedback*

Looking at negative feedback contingent upon intellectual aspects of the task, it was predicted that females would receive more intellectual criticism than males, and little of their negative evaluation would be for intellectually irrelevant aspects of their work, and conduct, in Maths. Contrary to expectations, males and females received similar amounts of negative feedback for intellectually relevant work aspects in Maths (see Table 11). Additionally, irrespective of subject, there were also no significant gender differences in the amount of nonintellectual appraisals given to students.

*Conduct Feedback*

Regardless of the subject being studied, no positive feedback was given for conduct. In both Maths and English, males and females received nearly half of all their negative evaluations for conduct.

**Table 11**  
***Percentages of Negative Feedback Contingent on Intellectual and Nonintellectual Work Aspects, and Conduct by Subject and Gender.***

	Maths		English	
	Males	Females	Males	Females
N	31	18	87	36
Intellectual	32	33	12	19
Nonintellectual	19	17	33	31
Conduct	48	50	55	50

## SPECIFICITY OF FEEDBACK

### *Specific versus General Feedback*

Other gender differences in the meaning which negative feedback acquires is evident when the specificity of the praise and criticism given to males and females is considered. Initial computations yielded significant differences in the nature of appraisals received in Maths,  $X^2(2, N = 162) = 6.52, p < .05$ . However, there were no significant differences in English.

### *Negative Feedback*

There were significant gender differences in the specificity of negative evaluation given to students,  $X^2(2, N = 167) = 15.40, p < .001$ . With males, in comparison with females, negative feedback was used more diffusely to indicate a variety of referents, in Maths. Only two thirds of the negative feedback given to males, regardless of subject, could be classified as specific (see Table 12). In contrast, all of the negative evaluation females received in Maths, and nearly 80% in English could be considered specific, indicating that it is unlikely that the meaning of this evaluation would be misinterpreted. This difference did not prove to be significant in English.

**Table 12**

***Percentages of Specific vs General Feedback Given to Students by Subject and Gender.***

	Maths				English			
	Males		Females		Males		Females	
N	49	29	45	18	59	73	65	32
Feedback Type	pos	neg	pos	neg	pos	neg	pos	neg
General	8	35	11	0	10	38	17	22
Specific	92	65	89	100	90	62	83	78

### *Positive Feedback*

Gender differences in the use of positive evaluation exhibited a different pattern, however. Over 90% of positive feedback received by males in both Maths and English was specific. In comparison, 17% of the praise females received in English, was used specifically. Thus, regardless of the subject being studied, all praise received by females was less specific in its referents than that given to males, as expected. However, these differences were not significant. Hence, hypothesis 1.18, which predicted that females would receive more ambiguous praise in Maths compared to English was not supported.

### *SUMMARY*

In conclusion, the results of the present investigation suggest that males and females are being treated differently in the classroom, but maybe not to the extent that was initially claimed. Overall males received more feedback than females, of which a greater proportion was negative. In Maths there were no significant gender differences in the proportions of total feedback that were negative and positive, although females received more praise in English, and males more criticism in Maths. Males and females received analogous amounts of feedback contingent upon intellectual and nonintellectual aspects of their work in Maths. However, females received more evaluation for the intellectual qualities of their work in English.

Similar proportions of positive evaluation were given to both males and females, with the great majority of praise being given to students for competence and correctness in both Maths and English. Irrespective of the subject, no praise was given for conduct. Additionally, the specificity of praise given to males and females was comparable. A similar pattern was evident when negative feedback was considered. Again, there were no gender differences in the proportion of criticism received by males and females for the intellectual quality of their work, and nonintellectual behaviours, with the majority of negative evaluation received by students being contingent upon intellectually irrelevant behaviours. Males did however receive more ambiguous criticism than females overall (although the



differences were not significant in either Maths or English), with the majority referring to nonintellectual behaviours.

Although no predictions were made pertaining to the absence of feedback, it was observed that teachers failed to respond to females, after a correct academic response more frequently, than with males. This observation was more common in English, compared to Maths.

## SECTION B: ATTRIBUTIONAL QUESTIONNAIRE

### *Preliminary analysis*

Prior to analysis the data set was thoroughly screened to ensure that the assumptions necessary for multivariate analysis had been met. All variables were found to be normally distributed, and missing cases randomly spread across variables, rendering deletion of these unnecessary.

Initial relationships between variables were evaluated using a correlational analysis. As expected several variables were significantly correlated (see Appendix 6), thus were combined to form several composite variables. All composite variables were formed by combining the two relevant questions, and dividing by two (so as not to change the scaling of the variable).

The two questions assessing students' perceptions of competence - How good do you think you are at English? and What percentage of students in your class do you think are better than you? were strongly correlated with each other, hence were combined to form a student's perceived competence. Students' expectations for future performance were obtained by combining questions 13 and 14; and desire to avoid future achievement related situations in a particular subject, was measured by combining questions 15 and 16. Students' beliefs concerning the likelihood that success can be achieved through effort were obtained by combining questions 17a

and 17b (following the recoding of 17b, so that now 1 = strongly disagree and 5 = strongly agree). A low score represents the view that success can be achieved by all through hard work, and a high score represents a belief that, for some individuals, success is not achievable through hard work.

## GENDER DIFFERENCES IN ATTRIBUTIONS

The question fundamental to this part of the analysis was whether or not males and females use different causal attributions for success and failure. Hypothesis 2.1 predicted that females, in comparison with males, would attribute success to external, unstable, uncontrollable causes and failure to internal, stable, uncontrollable causes. Males were predicted to evidence the opposite attributional pattern.

In order to address this question a series of one-tailed t-tests were performed. Results of this analysis indicated that there were no significant differences in the causal dimensions that males and females use to explain their successes and failures. Table 13 presents the mean scores for males and females on the proposed dimensions - how variable a cause was (stability), how controllable a cause was (controllability), and whether the cause was perceived as being internal or external (locus). All dimensions were measured on a six point scale, anchored with 1 = unstable, uncontrollable, or internal, and 6 = stable, uncontrollable, or external.

It is apparent from Table 13 that both males and females employed very similar attributions to explain their successes and failures. Although all the scores deviate little from 3 and 4 (the median scores), it is possible to see that both sexes attributed success to causes that were neither stable or unstable, reasonably controllable, and internal. Additionally, both males and females employed slightly unstable, internal attributions, that were perceived as neither controllable nor uncontrollable, to explain their failures.

Table 13

*Mean Scores for Attributional Dimensions by Gender.*

	Success		Failure	
	Males	Females	Males	Females
N	48	45	48	45
Stability	3.21	3.13	2.96	3.00
Controllability	2.63	2.96	3.10	2.96
Locus	2.90	2.73	2.98	2.80

### GENDER DIFFERENCES IN MASTERY AND LEARNED HELPLESS ATTRIBUTIONS

A new variable labelled "learned helpless for success" was computed. This was done by recoding all three causal dimensions into dichotomies, so each student's attribution was now scored as either stable or unstable, controllable or uncontrollable, and internal or external. All those cases with success attributions to at least two of unstable, uncontrollable or external causes were then categorised as learned helpless for success. In contrast, "mastery attributions for success" was computed by selecting all those cases where success was attributed to at least two of stable, controllable, and internal dimensions. In a similar fashion "learned helpless attributions for failure" included those who attributed failure to at least two of stable, internal, uncontrollable causes, and "mastery attributions for failure" included those who made at least two of unstable, controllable, external attributions for failure.

All cases were now recoded as either learned helpless or mastery oriented, for success and failure. Table 14 indicates the distribution of males and females defined as learned helpless or mastery oriented, for success and failure.

Table 14

*Students Defined as Learned Helpless or Mastery Oriented by Gender.*

	Success		Failure	
	Male	Female	Male	Female
N	50	47	50	47
Mastery oriented	35	31	28	32
Learned Helpless	14	14	21	13

#### *Gender Differences and Attributions*

It was predicted that females would develop learned helplessness more readily than males. Gender differences in learned helplessness and mastery attributions were analyzed with four one way t-tests. Regardless of whether a student succeeded or failed, there was no evidence to suggest that females are more likely to choose helpless attributions, or that males make more mastery attributions than females.

Hypothesis 2.3 suggested that mastery attributions for success and failure would be related to high perceptions of competence, high expectations for future success, a low desire to avoid future achievement related situations, the belief that effort does lead to success, and that the task is relatively easy. The opposite pattern of cognitions would be expected from students displaying learned helplessness.

The relationship between these variables is presented in Table 15. It is visible that helpless attributions for success are related to low perceptions of competence, and believing that success is not readily obtainable through effort. Accordingly, the opposite pattern of correlations is produced for mastery attributions. However, expectations, avoidance behaviours, amount of effort expended, and task difficulty did not yield significant correlations with either mastery or helpless attributions as expected.

**Table 15**

***Pearson Correlations Between Mastery Attributions, and Achievement-Related Beliefs.***

Variable	Success	Failure
Competence	-.33**	-.14
Effort	-.27*	-.15
Expectations	-.23	-.17
Avoidance	-.20	-.16
Difficulty	-.24	-.15

N = 88

\*p < .01. \*\*p < .001.

## **GENDER DIFFERENCES IN PERCEIVED COMPETENCE**

### ***Relationships Between Perceived Competence, and Achievement-Related Beliefs***

According to hypothesis 2.4, males perceive themselves as more competent. A one-tailed t-test revealed that males do indeed believe they are more competent than females do.

Hypothesis 2.5 predicted that for both males and females, high perceptions of competence would be related to expectations for future performance, perceptions of task difficulty, how much effort is expended on the task, the role of effort in achievement, and avoidance behaviours. Pearson correlation coefficients were computed to establish the relationship between perceived competence and achievement-related beliefs.

As demonstrated by data presented in Table 16, the predicted relationships between perceptions of competence, and other achievement-related variables were found. Regardless of the student's sex, those students who believed they were able, also had higher expectations for future success, evidenced low avoidance behaviours, tried hard, believed that success is indeed obtainable through effort, and thought that the subject was relatively easy. The opposite pattern was evidenced by those with low perceptions of competence.

**Table 16**

***Pearson Correlations Between Perceived Competence and Achievement-Related Beliefs***

Variable	Competence
Expectations	.64**
Avoidance	.56**
Effort Expended	.31*
Role of Effort	.35**
Task Difficulty	.53**

N = 90

\*p < .01. \*\*p < .001.

## **SEX-CONSISTENT VERSUS SEX-INCONSISTENT TASKS**

The hypotheses in this section involved comparing the answers of males and females in two subject areas - Maths and English. Analyses of variance (ANOVAs) were utilized to establish the existence of main and interaction effects, and significant differences analyzed through a series of one-tailed t-tests, run separately for each subject (Maths and English).

### *Perceived Sex-Appropriateness of the Task*

The main hypothesis for this section predicted that Maths would be perceived as a predominately "masculine" domain, and English a "feminine" domain. Results indicate that there were no significant differences on either questions of sex-appropriateness. Irrespective of the subject being studied, neither males nor females thought that they were more competent in the subject, or that it was more suitable for either sex.

### *Gender Differences in Attributions in Maths and English*

Despite there being little evidence of either Maths or English being sex-typed, it was decided nevertheless to continue with planned analyses. Although there were no significant differences in the attributions made by males and females for success and failure overall, the subject being studied was included as an independent variable in all subsequent analyses, and resulting differences measured.

### *Learned Helpless versus Mastery Attributions*

The first question to be addressed was whether or not females, in comparison with males make learned helpless attributions more frequently than males in Maths. However, no such differences were expected in English. One-tailed t-tests were employed, and results indicate that again, even when subject is considered as a variable, there are no significant gender differences in students' attributions. Interestingly, in English, the attributions of males for failure demonstrated more helplessness than those of females (the higher the number, the more helplessness or mastery is indicated) and females failure attributions evidenced a greater mastery orientation than those of males. These differences were not significant however.

### *Attributional Dimensions*

As no gender differences in learned helpless or mastery attributions were apparent, the three attributional dimensions were analyzed individually, using ANOVAs. The results of these analyses are presented in Table 18.

1. *Stability* - There were no significant main or interaction effects, indicating that males and females perceive the causes for success and failure in Maths and English as relatively stable.
  
2. *Controllability* - The subject main effect was significant  $F(1, 92) = 3.34, p < .05$ , but the Gender x Subject interaction effect was not. Attributions for success in English ( $x = 2.49$ ) were considered as more controllable by both males and females, than were those for Maths ( $x = 3.04$ ). However, when considering the controllability of attributions for failure, neither the subject main effect, or the interaction effects were significant.
  
3. *Locus* - For success attributions, the subject main effect was significant  $F(1, 92) = 4.45, p < .05$ , revealing that students considered attributions for success in English as more internal ( $x = 2.51$ ) than in Maths ( $x = 3.08$ ). Similarly, the subject main effect for failure attributions was also significant  $F(1, 92) = 5.02, p < .05$ , although again the Gender x Subject interaction effects were not. As shown in Table 17, reasons for failing in Maths were again believed to be more external, than failure attributions in English.



**Table 17**

*Mean Scores for the Attributional Dimensions for Success (s) and Failure (f) by Subject and Gender.*

	Maths				English			
	Males		Females		Males		Females	
	M	SD	M	SD	M	SD	M	SD
N	25		25		23		20	
s-stability	3.16	1.60	3.33	1.00	3.26	1.42	2.90	1.17
f-stability	2.92	1.52	3.00	1.27	2.96	1.49	2.35	0.99
s-control	2.84	1.55	3.27	0.92	2.39	1.20	2.60	1.57
f-control	3.27	1.73	3.23	1.30	2.87	1.46	2.55	1.15
s-locus	3.12	1.69	3.04	1.06	2.65	1.03	2.35	1.31
f-locus	3.23	1.39	3.04	1.14	2.64	1.29	2.50	0.95

## GENDER DIFFERENCES IN ACHIEVEMENT-RELATED BELIEFS IN MATHS AND ENGLISH

The six variables concerning perceptions of competence, expectations for future performance, task difficulty, effort expended and avoidance (perception and expectation variables), were analyzed in a 2 (gender) x 2 (subject) analysis of variance (ANOVA).

### *Perceptions of Competence*

Hypothesis 2.8 predicted that females, compared to males would have a lower perception of competence in Maths. No such differences were expected in English. Although no main effects pertaining to perceived competence were significant, there

was a significant interaction effect  $F(1,93) = 4.03$ ,  $p < .05$ , suggesting that how able a student perceives her/himself to be depends on both their sex, and the subject they are presently studying (see Table 18). Further information about the nature of this relationship was obtained using one-tailed t-tests. Results of these indicated that in Maths, females did indeed perceive themselves to be less competent than males,  $t(50) = -2.07$ ,  $p < .05$ . No significant differences were found for English however.

**Table 18**

*Mean Scores for Achievement-Related Beliefs by Gender and Subject.*

	Maths				English			
	Males		Females		Males		Females	
N	26		26		2		20	
Variable	M	SD	M	SD	M	SD	M	SD
Competence	2.52	0.87	3.10	1.12	2.82	1.00	2.60	0.75
Expectations	2.78	1.09	2.94	1.05	3.02	1.01	2.30	0.73
Expended	2.46	0.86	2.26	0.81	3.00	0.60	2.65	0.93
Avoidance	2.66	1.26	2.84	1.12	2.89	1.25	2.05	1.18
Difficulty	2.54	1.07	2.08	0.78	2.73	0.85	3.40	0.75
Effort	2.72	0.66	2.74	0.79	2.39	0.58	3.00	0.58

#### *Future Performance Expectations*

The only significant effect pertaining to expectations was the interaction effect  $F(1, 94) = 5.52$ ,  $p < .05$ . Interestingly, despite differences in perceived competence, no significant differences were found for males and females expectations for future performance in Maths, as predicted by hypothesis 2.9. Yet in English, females expected to do better than males  $t(41) = 2.48$ ,  $p < .05$ .

### *Avoidance Wishes*

Hypothesis 3.3 predicted that females would have a stronger desire to avoid Maths, and Maths tests, than males. There were no significant main effects, but the interaction effect was significant  $F(1, 94) = 4.34$   $p < .05$ . Analysis of t-tests showed an absence of gender differences in desire to avoid Maths. However in English, males had a significantly stronger desire to avoid achievement-related situations  $t(41) = 2.03$ ,  $p < .05$ .

### *Amount of Effort Expended*

The subject main effect was significant  $F(2, 95) = 5.47$ ,  $p < .01$ , indicating that both males and females try harder in Maths than English. The absence of a significant interaction suggests that hypothesis 2.11 is not supported, and males do not expend more effort in Maths than females do. Consistent with the prediction, no significant gender differences were evident in English.

### *Task Difficulty*

Whether or not task difficulty was related to perceived sex-appropriateness of the task was tested by hypothesis 2.12. A significant subject main effect  $F(1, 93) = 16.51$   $p < .001$ , revealed that both females and males think Maths is harder than English. Additionally, the interaction effect was significant  $F(1, 93) = 9.67$ ,  $p < .005$ . Results of t-tests showed that although there are no significant gender differences in how difficult Maths was thought to be, females believed English is easier than males do,  $t(41) = -2.50$ ,  $p < .05$ .

### *Success Through Effort*

The final hypothesis in this section predicted that females are more likely than males to believe that success cannot be achieved through increased effort. However, regardless of the subject, no significant main or interaction effects were found, although it appears that males believe effort is an important prerequisite for success, slightly more than females do.

*SUMMARY*

Neither English or Maths were perceived as more appropriate for males or females to study. No gender differences in students attributions for success and failure were found in either Maths or English. Thus, no support was obtained for the proposition that females would display a learned helpless attributional orientation, and males a more mastery orientation in Maths (a masculine domain). Additionally no differences in males' and females' attributional patterns in English were found.

Although males perceived themselves as more competent in Maths, there were no gender differences in constellations of achievement-related beliefs. Surprisingly, despite no gender differences in perceived competence in English, females evidenced higher expectations for future performance, wished to avoid English performance settings less, and thought that English was easier than males did.

## CHAPTER 5

### DISCUSSION

The purpose of the present study was to examine the underachievement of females in mathematical areas within the context of the attribution theory. It was speculated that the disparate responding of males and females in response to success and failure would be related to content areas and different feedback histories.

#### OBSERVATIONAL STUDY

Results of this investigation partially mirrored those of previous studies. Consistent with the findings of Neale (1978), males received more overall (positive and negative) feedback than females. Thus, it is possible that when a female receives any type of evaluation from a teacher, it assumes more importance as there is less of it.

Replicating the findings of Dweck et al. (1978), males received significantly more negative feedback, and less positive feedback than females overall. Moreover, negative feedback was used more diffusely with males, indicating a variety of referents. It is likely that this indiscriminate use of criticism causes it to lose its meaning as a relevant evaluation of intellectual performance. Further, as teachers were habitually more negative than positive towards males, this tendency of teachers to be more critical of males than females can easily be incorporated into a general framework of teachers' negative attitudes towards males. Criticism then, may be interpreted as reflecting teacher biases, not deficits in their intellectual performance. Hence males' academic failures can easily be attributed to the negative attitude of the evaluator, an external, uncontrollable, variant cause.

In comparison, negative evaluation given to females was used in a more specific manner, and the type of response upon which the criticism was contingent readily

apparent. Considering that females believe that teachers consider them to be harder working than males, and that teachers like females better (Dweck et al., 1978), the specific use of negative feedback may be readily interpreted by females as indicating intellectual inadequacies in their performance.

This deduction is likely to be magnified when gender differences in the typical referents of evaluation are examined. Replicating the results of previous research, the majority of the criticism given to males was contingent upon nonintellectual behaviour (conduct and nonintellectual aspects of work), again increasing the ambiguity of feedback, and impairing its meaning as an evaluation of the intellectual quality of the students work. It is assumed that this pattern of feedback easily allows males to disregard negative evaluation as a relevant assessment of the intellectual quality of their performance.

Surprisingly, and quite inconsistent with results of other studies, the pattern of negative feedback females received was remarkably comparable to that of males. Although they received significantly less overall criticism than males, its typical referents and frequency relative to positive feedback, were quite similar. Analogous with males, females received the majority of their negative evaluation for work irrelevant aspects, and conduct. This implies that females should also be able to question the objectivity of the teachers appraisal of their performance, and similarly conclude that academic failure is attributable to teacher bias, and not a valid assessment of their intellectual competence.

Dweck et al. (1982) reported the more sparing and discriminating use of negatives with females, lending them to conclude that females, more readily than males, tend to interpret failure feedback as indicating a lack of ability. However, the results of the present study do not indicate that females receive more favourable feedback than males, and although there were no significant differences in the typical referents of criticism, with males negative evaluation was used in ways which would make it more uninformative about their ability.

It was hypothesized that positive evaluations too, would be used in a way that would make it more indicative of ability for females than males. That is, females, in comparison to males, would receive more diffuse, positive feedback. Contrary to predictions, females and males received analogous proportions of positive feedback. Also surprising was that it was the males in the classroom who received the most diffuse praise. Dweck et al. (1978) propose that the diffuse use of positives may lead students to conclude that the praise doesn't reflect scholarly work, but is instead indicative of the teachers favourable attitude. Hence, given the results of the present study, it would be expected that if anyone, it would be males, who would interpret positive feedback as indicating a teachers favourable attitude, and not intellectual competence.

It was also predicted that evaluative feedback in Maths and English is would differ in ways that may occasion different attributions, resulting in females showing more debilitation in Maths, and males displaying more impairment in English. Males received more overall feedback than females, which led to the suggestion that when a female receives any type of evaluation from a teacher, it assumes more importance as there is less of it. It is possible that this consequence may be exaggerated in Maths classrooms, as Maths teachers give considerably less feedback than English teachers.

Additionally, Maths is a subject area in which failures are likely to be more frequent and highly salient, and failure feedback in Maths can plausibly be seen as an objective assessment of ability. Dweck and Licht (1980) suggest that females are more likely to show debilitation in areas where failure feedback is most easily interpreted as a condemnation of their ability, whereas males will display impairment where criticism reflects teachers' negative subjective judgements.

However, inconsistent with these conjectures, males and females received very similar proportions of criticism in Maths and English. The pattern of negative feedback males and females received for nonintellectual aspects of their work was comparable in Maths and English, with there being no gender differences in the proportion of negative evaluation received by students for aspects of their work such

as neatness, instruction following, etc. Both males and females received nearly three quarters of their negative feedback in Maths and English, contingent upon nonintellectual behaviours. Thus, the assumption that females perform more poorly in Maths because they interpret failure feedback as a condemnation of their ability, was not supported.

Additionally, whereas other studies have found teachers to be more critical of males' conduct than that of females, the present study found no gender differences in the proportions of negative evaluation given for conduct in either subject. Therefore, it is likely that both males and females, in Maths and English, will view criticism as reflecting the teachers negative attitude towards them, and not implying a lack of intellectual competence. Combined with the fact that there were no gender differences in the specificity of negative evaluation given to students, it would be expected that there would be few differences in the meaning males and females give to evaluation in Maths.

A slightly different picture emerged however when the use of positive evaluation in English was appraised. Females received more praise than males, implying that they would be more likely than males (who received predominantly negative evaluation) to perceive the teacher as fostering a positive attitude towards them. Thus, when females received negative evaluation in English, it would be expected that they would interpret it as indicating intellectual inadequacies in their work. However, there were no significant gender differences in the typical referents of praise given to students. Both males and females received the vast majority of their praise for intellectually relevant aspects of their work. Interestingly, neither males or females, in Maths nor English received praise for conduct.

Thus, results of the present investigation indicate that although overall teachers are more positively inclined towards females, they receive analogous proportions of their feedback for intellectual and nonintellectual behaviours. Moreover, positives were used in quite a specific manner with both sexes. Hence it is unlikely that there will be gender differences in the way in which students interpret this feedback, with



males and females both viewing praise as indicative of ability, and not reflecting the teacher's favourable attitude, or as referring to nonintellectual qualities of their work.

An interesting serendipitous finding of this study also emerged. Females experienced significantly more instances where feedback was absent than males. That is, often they would respond to a question but be ignored. On all these occasions, the correct answer had been given. This conflicts with the results of Dweck et al. (1978), who observed that males, more frequently than females, received no feedback for correct answers. Absence of evaluation following an academic response was much more common in English than Maths. It is plausible then that failure of the teacher to respond to females when correct is interpreted by them as disinterest, and be may attributed to a negative attitude of the teacher. Hence the property of feedback to provide an evaluation of ability may be deleteriously impaired.

In conclusion, it can be seen that contrary to results of other studies of this nature, teachers do not appear to be treating males and females differently in any consistent ways. Although Dweck et al. (1978) found that females tend to interpret and respond to failure feedback in such a way that they are more likely to display learned helplessness than males, the results of the present investigation do not maintain this conclusion.

## ATTRIBUTIONAL QUESTIONNAIRE

This part of the study endeavoured to assess students achievement-related beliefs in Maths (traditionally a masculine subject) and English (traditionally a feminine subject). Thus, the question fundamental to this section was whether or not males and females perceived these subjects as gender specific domains. Replicating the findings of Loveridge (1986), Maths and English were perceived by the majority of students to be equally suitable for males and females to study.

Hence, results of the present study can not be interpreted as "gender differences in sex-typed tasks" as anticipated, but will instead be referred to as gender differences in Maths and English. Inclusion of Maths and English in subsequent analyses revealed some interesting gender differences, suggesting that task characteristics, other than its perceived sex-appropriateness are influencing students' achievement-related beliefs in different subject areas. The subject being studied will therefore still be included in the ensuing discussion.

The absence of any evidence which suggests that these subjects are typically sex-typed, possibly can be explained with regard to changing societal beliefs and interactions, and research which suggests that classroom practices are rapidly being modified to make the schooling experience as comparable as possible for males and females. School materials and media have been examined in several reviews recently (Tittle, 1986), and results indicate that the use of nonstereotyped materials, language, and media portrayals can effect students' attitudes and perceptions.

## **GENDER DIFFERENCES IN ATTRIBUTIONS**

The question integral to this part of the study was whether or not there were gender differences in the attributions fifth form students in New Zealand used to explain their successes and failures. Overall it was found that there were no differences in the causal dimensions students employed to explain their success and failures. Both males and females most frequently described their reason for succeeding as controllable and internal, and most frequently described the most likely reason for failing as unstable and internal. Consequently, there was little evidence that females develop learned helplessness more readily than males.

Also noteworthy was the tendency for both males and females to favour internal attributions in explanation of both success and failure. This result mirrors the findings of Waayer (1987) who studied the attributions of New Zealand fifth form English students. Inconsistent with the literature, Waayer found that lack of ability

was the cause most frequently used to explain failure. Overall, these results are consistent with the findings of Loveridge (1986), who, using a similar methodology, concluded that there was little evidence to support the proposition that gender differences in educational and occupational areas are mediated by the differential use of attributions by males and females. This led her to suggest that *"the power of the attribution construct, may have been overestimated, and that attributions do not necessarily mediate differences in achievement in the way that the Weiner model proposes"* (Loveridge, 1986, p.122). Results of the present investigation clearly support this proposition.

It is very possible that the failure of the present study to replicate the findings of previous research is a function of the methodology employed. It has already been illustrated that the instrumentation used to obtain students' attributions in much research of this nature is frequently criticised as it generally involves researchers imposing definitions of success and failure on structured sets of causal attributions, in experimentally-contrived settings. Hence, the validity and generalizability of these studies is questionable. Results of the present study suggest that it is possible that when students are allowed to define success and failure themselves, and generate their own set of causal explanations, in a "real" setting, the attributions of males and females do not differ.

## **RELATIONSHIPS BETWEEN ATTRIBUTIONS AND ACHIEVEMENT-RELATED BELIEFS**

Research has revealed several relationships between causal attributions for success and failure, and future achievement-related beliefs. Partially consistent with the literature, the present investigation found that different constellations of achievement cognitions for success and failure are associated with disparate future perceptions and expectations. As predicted, mastery attributions were associated with high perceptions of competence. Available literature documents that when responsibility

is taken for a positive outcome, maximum pride and security can be derived. If this same success had been attributed to external factors, little pride would be felt. Moreover, if this factor was also perceived to be unstable, there is little security that success will recur (Frieze et al., 1978; Nicholls, 1978; Weiner, 1979).

Mastery attributions were also associated with the belief that success is readily obtainable through effort. Surprisingly, there was no significant relationship between attributions, and expectations for future success, desires to avoid achievement situations, how much effort was expended on the task, or how hard the task was perceived to be.

## **GENDER DIFFERENCES IN ATTRIBUTIONS IN MATHS AND ENGLISH**

It was speculated also that gender differences in attributions may be related to content areas, and that due to the nature of the tasks, females achievement-related beliefs and attributions would be more maladaptive in mathematics than verbal areas. Regardless of subject, males and females differed only slightly in their causal attributions in Maths and English, with the only notable discrepancy being a slight but non significant tendency for males to evidence more helpless attributions in English than females.

Even when each dimension was examined separately, few gender differences emerged, with differences in the subject studied being more common than significant differences between males and females attributional dimensions. Interestingly, both males and females perceived their attributions for success in English to be more controllable and internal than attributions in Maths, and explanations for failure in Maths were considered to be more external.

## **GENDER DIFFERENCES IN PERCEIVED COMPETENCE**

Attribution theory assumes that students achievement behaviours and cognitions are mediated by ability perceptions. The prediction that males would believe they are more competent than females was supported. Additionally, it was found that males had a significantly higher perceived ability than females in Maths. Despite this confidence in their ability however, males did not expect to perform better than females in future, nor did they try harder in Maths, want to avoid Maths achievement situations any less, or think Maths was easier, than females did.

Using a similar methodology, Stipek (1991) also found that males believed they are more competent than females in Maths. However inconsistent with results of the present study, Stipek reported that males had higher expectations for future success, claimed that Maths was easier than females did, perceived effort as more likely to ensure success, and expressed less desire to avoid Maths in the future.

As predicted, there were no gender differences in perceived ability in English. However contrary to expectations, some relationships between perceived competence and achievement-related beliefs in English were found. On average, females, in comparison to males, expected to perform better, wished to avoid English achievement-related situations less, and believed English was easier. These results suggest that ability perceptions may not be as related to constellations of achievement-related beliefs as initially thought. Although not explicitly perceived as sex-appropriate, the constellations of achievement-related beliefs exhibited in English suggest more mastery-oriented pattern of cognitions than males'.

## **PROPOSED LINKS BETWEEN OBSERVATIONAL AND ATTRIBUTIONAL DATA**

Although many of the reported relationships were statistically significant, in reality, there were only small differences between males and females, in Maths and English.

Hence the following suggestions regarding possible links between the data obtained in the two parts of the present study can be, at best, only tentative.

It was found that contrary to predictions, there were only slight differences in males and females causal attributions in Maths and English, with the only discrepancy being that males made more helpless attributions in English than Maths. This result is surprising when the nature and frequency of evaluative feedback is considered. In Maths, there were few gender differences in the amount of positive and negative feedback received by students, or the proportion of this feedback which referred to competence and correctness, or nonintellectual behaviours. In English however, females received significantly more praise than males, possibly resulting in the belief that the teacher likes them more than males. Thus, when they receive negative feedback it would be expected that they would view it as a valid index of their abilities, as typically the teacher is quite positive towards them.

Moreover, males received significantly more negative evaluation in English than females. It has been proposed that this tendency of teachers to be more critical of males means that they, more easily than females, can incorporate criticism into their general belief that teachers don't like them. Hence, failure feedback can readily be interpreted as reflecting teacher bias, and not inadequacies in intellectual competence.

Additionally, males received more ambiguous criticism than females in both Maths and English. It would be expected therefore that males would more readily be able to disregard negative feedback as an indicant of their ability, interpreting it instead as reflecting the teacher's negative attitude towards them. Further, the literature suggests that considering the specific nature of negative evaluation given to females, they should more readily interpret failure feedback as indicating a lack of competence, hence display learned helplessness more readily in these subjects. Therefore, that males should display more learned helplessness in their achievement-related cognitions in English than females, is again incongruent with the way these observed contingencies of evaluation are commonly interpreted.

It was found that males, in comparison to females perceived themselves to be more competent in Maths, whereas there were no gender differences in ability perceptions in English. Looking at negative evaluation contingent upon nonintellectual behaviours, males and females received similar amounts of criticism in both Maths and English, which implies that neither males nor females should interpret failure feedback as a condemnation of their ability, regardless of subject. Again, these cognitions are incongruent with the observational data.

## SUGGESTIONS FOR FUTURE RESEARCH

The findings of the present study indicate several lines of inquiry which could be investigated in future research. Firstly, it is evident that the results of the present study essentially fail to replicate findings in previous research. It is suggested therefore that more local research, both observational and attributional, using New Zealand students is needed. It may be that the inconsistent nature of the results obtained in the observational study, compared to the findings of Dweck et al. (1978), can be attributed to the different ages of the students in the each studies sample. Whereas, the students in the present study were all aged between 15 and 17 years old, the students in Dweck et al's., sample were only fourth and fifth graders. Similarly, the results of the present study only partially mirrored those of Neale (1978) who studied first and second formers. It may be informative therefore to repeat the present study, with a younger sample, as it is quite possible that the contingencies of evaluative feedback which influence students ability assessments, and subsequent attributions and achievement-related beliefs, may evidence at an earlier age than that studied in the present investigation.

Available literature documents that gender differences in cognitive and behavioural responses to failure feedback may also be a function of the sex of the evaluator, and students may learn to interpret and respond differently to feedback from different agents. Research indicates that sex of the evaluator can also effect students attributions, and the nature and frequency of feedback teachers give students. In particular,

it appears that females show greater helplessness when the evaluator is also female. Local research (Neale, 1978) has found that male and female teachers do interact differently with students, which may promote gender differences in reactions to evaluative feedback. Thus, it may be valuable to perform the present study, using males and females as the evaluative agents, in both Maths and English teachers.

The present study obtained few significant results pertaining to the existence of gender differences in attributions, despite the wealth of literature which suggests differently. It is possible that these equivocal findings are a function of the methodology used, and previous attributional research, which has reported gender differences in achievement related cognitions may need to be reconsidered, due to a lack of ecological validity. With consideration to this finding, more research is clearly needed in educational settings, investigating the causal attributions students cite for achievement outcomes in "real" academic situations. Future research also needs to take into account an apparent need for respondents to rate their own attributions on the causal dimensions.

It may be also be worthwhile to perform a similar investigation in subjects such as workshop craft and home science, that are more likely to be perceived as typically masculine and feminine domains respectively, since it appears that New Zealand students do not sex-type Maths or English. Hence it was not possible to test the hypotheses pertaining to perceived sex-appropriateness of the task.

## CONCLUSION

Speculation about differences between males and females is a national preoccupation, which is reflected in the amount of research afforded to gender related issues. Much literature has documented that females are dramatically under-represented on university mathematics faculties, even in relation to the numbers of women trained in graduate programmes. They have limited access to mathematical fields and less earning power than males (Jacklin, 1989). The purpose of the present investigation



was to examine the relevance of learned helplessness theories for explaining the relative lack of achievement and participation of females in mathematical areas. Contrary to predictions, females were not more likely than males to display helpless cognitions and behaviour, and males were not more likely to be mastery oriented. These results were constant over Maths and English.

In search of an explanation for the disparate numbers of males and females in Maths achievement situations, the present study investigated also the relationship of gender and teacher-student interactions. In an attempt to conceptualise the role they may have in sustaining gender related behaviours of students, an observational study was conducted in Maths and English classrooms. Of particular interest were the specific contingencies of evaluative feedback given to students, by their teachers. It was hypothesized that males and females were being treated differently in Maths and English classrooms, which in some way affects their cognitions in achievement situations, and subsequent achievement behaviour.

However, there are only slight gender differences in the patterns of evaluative feedback received by students, with respect to its frequency, its typical referents, and the specificity of its use, and apparent differences were not consistent in their implications. Hence, there would be few gender differences in assessments of ability, and subsequent attributions and achievement-related beliefs in Maths and English that are due to the nature of gender and teacher-student interactions.

Thus, congruent with the proposition of Stipek, (1991), results of the present study suggest that the mechanisms by which females self-derogating beliefs might inhibit them from participating in Maths-related activities have not been fully explored. To this end, Linn and Hyde (1989) employed a meta analysis and to investigate the assumption that males have a greater access to mathematical, and other typically "masculine" occupations, as a result of cognitive and psychosocial gender differences.

However, results of recent studies indicate that differences in males and females cognitive abilities have declined in many areas, and no longer exist for verbal ability,

spatial visualisation, and mathematics computation and concepts. Additionally, psychosocial gender differences are also declining and do not offer an adequate explanation for these educational and occupational disparities. Instead, Linn and Hyde conclude that gender differences in height, weight, physical strength, career access, and earning power are much larger and more stable than cognitive and psychosocial gender differences. Or in the words of Rosenthal and Ruben (1982) "*females appear to be gaining in cognitive skill relative to males rather faster than the gene can travel!*" (p. 711).

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**APPENDIX 1: Questionnaire**

ENGLISH SURVEY:

AGE \_\_\_\_\_

SEX \_\_\_\_\_

ETHNIC ORIGIN \_\_\_\_\_

**DIRECTIONS:** This is a questionnaire about how you feel about English. For each of the following questions, circle the answer you think best describes you. As your name isn't included all answers are totally confidential, and I am the only person who will see them. Remember, there are no right or wrong answers, so answer all questions as truthfully as you can.

1. How good do you think you are at English?

1	2	3	4	5
very				very
good				bad

2. What percentage of students in your class do you think are better than you?

0-20%	20-40%	40-60%	60-80%	80-100%
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3. How hard do you try in English?

1	2	3	4	5
very				not at
hard				all

4. How hard do you think English is?

1	2	3	4	5
very				very
hard				easy

5. Think about when you do well in English. List the 3 most important reasons why you might have done well below, with the most important reason first, and the least important reason last.

1. \_\_\_\_\_

2. \_\_\_\_\_

3. \_\_\_\_\_

6. Now, think of the most important reason for doing well in English again. If 1 = something that changes with time (i.e., is unstable), like the weather, and 5 = something that doesn't change with time (ie. is stable), like the colour of your eyes... where on this scale would your reason be?

1	2	3	4	5	6
something that changes					something that doesn't change

7. Now, if 1 = something you can control, like who your friends are, and 5 = something you can't control, like the weather... where on this scale would your reason be?

1	2	3	4	5	6
something you can control					something you can't control

8. Still thinking of the most important reason for doing well in English... if 1 = something that is inside a person like their feelings, and 5 = something that is outside a person like the weather, where on this scale would your reason be?

1	2	3	4	5	6
something inside a person					something outside a person

9. Now I want you to think about when you don't do well in English. List the 3 most important reasons why you might not have done well below, with the most important reason first, and the least important reason last.

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_

10. Now, think again of the most important reason for not doing well in English. If 1 = something that changes with time, like the weather, and 5 = something that doesn't change with time, like the colour of your eyes... where on this scale would your reason be?

1	2	3	4	5	6
something that changes					something that doesn't change

11. Now, if 1 = something you can control, like who your friends are, and 5 = something you can't control, like the weather... where on this scale would your reason be?

1	2	3	4	5	6
something you can control					something you can't control

12. Still thinking of the most important reason for not doing well in English... if 1 = something that is inside a person like their feelings, and 5 = something that is outside a person like the weather, where on this scale would your reason be?

1	2	3	4	5	6
something inside a person					something outside a person

13. How well do you think you will do in School Certificate English?

1	2	3	4	5
very well				not very well at all

14. Although it is compulsory for you to take 6th form English at Wairarapa College, if you had the choice would you take English next year?

1	2	3	4	5
very definitely				definitely not



15. Do you wish you could just stop taking English now?

1	2	3	4	5
not at				a whole
all				lot

16. If you had the choice, would you try to get out of sitting the next English test?

1	2	3	4	5
definitely				very
not				definitely

17. Do you agree or disagree with the following statements?

a) Everyone could do well in English if they worked hard.

1	2	3	4	5
strongly				strongly
agree				disagree

b) A few people will never do well in English, even if they worked hard?

1	2	3	4	5
strongly				strongly
agree				disagree

18. In your class, who do you think are better at English?

1	2	3	4	5
males				females

19. Finally, there are some subjects that people think of as more suitable for females, like Nursing, and other subjects that people think of as more suitable for males like Engineering. Indicate on the scale below where you think English is.

1	2	3	4	5
more				more
suitable for				suitable for
females				males

Thank you, you have now finished.



**APPENDIX 3: Information Letter to Parents and Caregivers.**

Department of Psychology  
Massey University

2 August 1992.

Dear parent or caregiver,

Pupils in your child's class have been asked to participate in a research project during the week of 10 - 14 August. This letter is to inform you of what is involved.

The study is an investigation into how students feel about taking Maths and English at school, how they feel when they do well, and how they feel when they don't do very well. Importantly, it addresses why some students prefer to study Maths, and others prefer to study English.

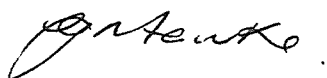
The study involves the class your child is in being observed for one week. At the end of the week each student will be asked to fill in a short questionnaire. All answers will be treated as confidential. Participation in the study is not compulsory, however everyone's cooperation would be most helpful, and greatly appreciated. It is hoped that the study will shed light on the nature of student's motivation to take different subjects, and thus be of practical value to teachers.

The study is being fully supervised by Massey University

I am happy to answer any further questions you may have about the study and can be contacted on 377-5589, during the week of the study.

Thank you for your support.

Yours sincerely



Gillian Hawke (researcher).

**APPENDIX 4: Verbal Instructions to Students.**

Now that I have seen what happens in your class for a week, I would like you all to fill in a short survey for me. It asks you to write down how you feel about Maths/English, how good you think you are, and why sometimes you do well, and other times you don't do so well. It also asks if you think you will take Maths/English next year. This sort of study is important because the attitudes and feelings we have about a subject can have quite a big effect on how well we do. The reason for the study is to educate teachers to be a bit more sensitive to how their students feel about their work, so that you can enjoy learning Maths/English more.

So, it's very important for everyone to answer as honestly as possible. That way we can hopefully come up with some useful ways of changing how teachers treat their pupils. All the information you write down is absolutely confidential, and I am the only one who will see it. You don't even have to give me your name. But it is important that you fill in your age and sex at the top of the page.

Ok, now I'll start to hand round the questionnaire. When you get it just fill in your age and sex, and read the directions to yourself. Remember, this is not a test, so there are no right or wrong answers.

When you have finished just sit quietly, and wait for everyone else to finish. It should probably take about 20 minutes for you to finish all the questions. Be careful not to miss any questions out. Does anyone have any questions?

**APPENDIX 5: Consent Form.****CONSENT FORM**

I \_\_\_\_\_ (full name) agree to take part in this study.

The nature and purpose of this study have been explained to my satisfaction.

- I understand that the questions concern how students feel about English, both when they do well, and also when they don't do so well, and the reasons for their performance.
- I understand that my responses are anonymous and confidential.
- I understand that I can skip any question I want to.
- I understand that I can withdraw from the study at any time.
- I understand that the researcher conducting this study will keep this sheet with my name on it in a secure place, and that my name will not be linked with my questionnaire answers.

\_\_\_\_\_ (signature)      \_\_\_\_\_ (date)

# APPENDIX 6: Correlation Matrix for Combined Variables.

Table 19

## *Correlation Matrix for Combined Variables.*

Variable	Compet Q2	Expect Q14	Avoid Q16	Effort Q17b
Competence Q1	.49**			
Expectations Q13		.39**		
Avoidance Q15			.54**	
Effort Q17a				.44**

N = 93

\*p < .01. \*\*p < .001.