

Copyright is owned by the Author of the thesis. Permission is given for a copy to be downloaded by an individual for the purpose of research and private study only. The thesis may not be reproduced elsewhere without the permission of the Author.

**TOWARDS AN INTEGRATED BIOPSYCHOSOCIAL  
RISK MODEL OF DISTRESS DISORDER  
AETIOLOGY  
FOR CHILDREN OF MIDDLE CHILDHOOD**

A thesis presented in partial  
fulfilment of the requirements for  
the degree of

**DOCTOR OF PHILOSOPHY IN PSYCHOLOGY**

**NANCY ELEANOR STUART**

**Massey University**

**2004**



## ABSTRACT

Recent theoretical developments both within and outside the clinical literature have stressed the complex interactions between biological and environmental risk in relation to psychopathology development. They have also highlighted the importance of cognitive dimensions, especially those related to control perceptions, in the developmental path towards anxiety and mood disorders in children. Few studies have investigated these cognitive dimensions in relation to risk and protective factors. In light of these considerations, the present study evaluated structural models investigating the relationship of perceived control and competence to child temperamental risk, parent personal risk, family environmental risk and anxious and depressed feelings. It was hypothesised that temperamental, and psychological risk in relationship to family environment would be mediated by the cognitive dimensions of perceived control and competence. It was further hypothesised that family environment, would mediate the relationship between child temperamental risk and anxious and depressed feelings. A school sample of 293 New Zealand children aged between 8 and 11 and their parents was assessed using a cross-sectional design. Overall results indicated that in the face of temperamental and family adversity, feeling in control of emotions and social interactions and feeling socially competent afforded children protection from anxious or depressed feelings. In addition, a sensitive, accepting family environment was seen to protect a temperamentally vulnerable child from distressed feelings. In contrast, distress was more likely to occur when a temperamentally vulnerable child lived in a family characterised by parental psychological control and conflict than one characterised by less cohesion and parental rejection. Results also indicated that, in terms of cognitive features, perceptions of social competence were particularly important in protecting a child from having anxious or depressed feelings. These findings are discussed in relationship to Barlow's and other recent integrated aetiological theories of distress disorder. Findings are also considered in relation to implications for identification, intervention and prevention strategies for distressed children in both clinical and school populations. Further results, limitations and proposals for future research are also discussed.

## DEDICATION

This thesis is dedicated to the memory of three special people who passed away during its writing:

my Father      *Harry L. Wilson* who believed in me and taught me that  
anything is possible.

my dear Friend *Ruth Parry* whose respect for and way with children and gift  
as a family therapist have been a model to me  
in my work and my research.

my Friend and Colleague *Trudy MacKay* whose energy and passion for  
family and the rights of all children  
to be safe, secure and to belong  
has inspired me.

## **ACKNOWLEDGEMENTS**

The completion of this dissertation was made possible through the encouragement and willing involvement of many people. First, I am indebted to my principal supervisor, Associate Professor Dr. Kevin Ronan for his unwavering positivism and encouragement throughout my research. I wish to especially thank him for his problem-solving support, constructive criticism and excellent feedback on the final drafts of my thesis. Here, too, I would like to thank my second supervisors, Cheryl Wooley, for her early input and Dr. Nancy Pachana for her kind feedback regarding my results.

Huge thanks go to my wonderful family who offered their support and expertise: my husband John for his encouragement when I was struggling, for his pride and steadfast belief in my ability to do this; my daughter Tricia, whose wisdom beyond her years helped me shape my ideas, kept me from waffling and suffered silently as I talked through my dilemmas; my son David, whose patience and technical expertise taught me how to save untold hours of labour with the finished product. Thanks also goes to Tara, my study-buddy, who was always there for me and made me take breaks that renewed my clarity. Here too, I would like to thank my parents who taught me, by example that rewards come from striving for what I believe in and finishing what I start.

Further, I want to thank my friends: John and Merle who tracked my progress; Maggie, who quietly supported me, Anthony for his 'fundamental' advice in forming my hypotheses and Ruth, who offered endless lunches and cuppas when I needed a break from writing. I am also grateful to Lisa and Rod for their able data collection assistance, Karmyn for her technical assistance, Caryl for letting me ramble and Joy and Russell for keeping in contact when my focus was elsewhere. Also sincere thanks go to so many others—Dale, Debbie, Gabrielle, John, Linda, Mary, Mike, Ros, Rose who encouraged me. A special thank you goes to my friend, Dr. Robin Fancourt, whose courage and belief in children, families and my research has been such an encouragement.

Finally, I would like to thank the children and parents who took part in my study. Without their trust and willing participation, this thesis would not have been possible. Also, huge thanks are extended first to Neil, the principal of my pilot school and to the principals, teachers and Boards of Trustees of the other schools that participated in the research. Without your trust and belief in the integrity of my study, I would not have been able to conduct it.



## TABLE OF CONTENTS

Abstract .....	iii
Dedication .....	iv
Acknowledgements .....	v
Table of Contents .....	vii
List of Tables.....	xii
List of Figures.....	xii
 Chapter 1. INTRODUCTION AND OVERVIEW .....	 1
1.1. Chapter Overview .....	1
1.2. Identifying the Climate where a Model of Distress Disorder Aetiology Fits .....	1
1.3. Overview of the Research to be undertaken .....	4
1.4. Outline of Chapters to Follow .....	6
 Chapter 2. DEFINING ANXIETY IN CHILDREN .....	 9
2.1. Chapter Overview .....	9
2.2. Fear and Anxiety .....	9
2.2.1. Adaptive Anxiety .....	10
2.2.1.1. Adaptive Fears, Development, Gender, Social Status and Culture .....	11
2.2.2. Maladaptive Anxiety .....	12
2.2.2.1. Presentation of Maladaptive Fear and Anxiety .....	14
2.2.2.2. Diagnosis and Classification of Childhood Anxiety .....	15
2.2.2.3. Prevalence, Comorbidity, Age and Sex Differences .....	17
2.3. Problems with Identification of Distress-Prone children .....	20
2.3.1. Consequences of Not Identifying the Anxious Child .....	20
2.4. Prognosis and Remittance .....	21
2.5. Chapter Summary .....	22
 Chapter 3. THE CONSTRUCT OF NEGATIVE AFFECTIVITY: CONNECTING ANXIETY WITH DEPRESSION .....	 25
3.1. Chapter Overview .....	25
3.2. How Anxiety and Depression are Linked .....	25
3.2.1. Genetic Links between Anxiety and Depression .....	26
3.2.2. The Sequential relationship between Anxiety and Depression .....	27
3.2.3. Structural Models Connecting Anxiety with Depression .....	28
3.2.3.1. Two Factor Model .....	29
3.2.3.2. Tripartite Model .....	30
3.2.3.3. Three Factor Model .....	31
3.2.3.4. Hierarchical Integrated Model .....	32
3.3. Differentiating between Anxiety and Depression .....	34
3.3.1. Self-Report Measures .....	34
3.3.2. Cognitive Features .....	35
3.4. Chapter Summary .....	39
 Chapter 4. THE STUDY OF RISK AND PROTECTION FOR DISTRESS DISORDER DEVELOPMENT ..	 41
4.1. Chapter Overview .....	41
4.2. Rationale for the Study of Risk and Protection with Distressed Children .....	41
4.3. Profile of an Anxious Child: What Constitutes Risk .....	42
4.4. Conceptual Framework for Assessing Antecedents of Childhood Distress .....	43
4.5. Study of Risk and Protection for Distress .....	44
4.5.1. Acceptable Methods for Risk Factor Research .....	48
4.6. Chapter Summary .....	48

Chapter 5. BIOLOGICAL VULNERABILITY AS A RISK FOR CHILDHOOD DISTRESS .....	51
5.1. Chapter Overview .....	51
5.2. The General Biological Vulnerability Component of Barlow's Model of Anxiety and the Process of Anxious Apprehension .....	51
5.3. Evidence of a General Biological or Temperamental Vulnerability to Anxiety.....	52
5.4. Continuity of Anxious Temperamental Disposition .....	54
5.5. Theories of Temperament related to Anxiety Vulnerability .....	56
5.5.1. Rothbart's Theory of Reactivity .....	58
5.5.2. Buss and Plomin's EAS Theory of Temperament.....	59
5.5.3. Kagan's Construct of Behavioural Inhibition .....	61
5.6. Child Temperament, Parent Personal vulnerability and Parenting Styles .....	64
5.7. Chapter Summary .....	68
Chapter 6. INTRODUCTION TO EARLY ENVIRONMENTAL VULNERABILITY/ PROTECTION .....	69
6.1. Chapter Overview .....	69
6.2. The Effect of the Environment on the Developing Nonhuman Brain.....	69
6.3. The Capacity of the Human Brain to be influenced by the Environment.....	70
6.4. Environmental Influences on the Development of Childhood Distress .....	71
6.5. The Early Environmental Vulnerability Component of Barlow's Model .....	72
6.6. Environmental Adversity: Related Models and Research .....	74
6.7. Chapter Summary .....	75
Chapter 7. THE ATTACHMENT RELATIONSHIP: THE FIRST CONTINUOUS ENVIRONMENTAL INFLUENCE .....	77
7.1. Chapter Overview .....	77
7.2. Bowlby's Theory and Definitions of Attachment .....	78
7.3. Ainsworth's Operationalisation of Bowlby's Theory .....	78
7.4. Bowlby's Working Model.....	82
7.4.1. Working Model Phases: The Beginning of a Sense of Control .....	83
7.4.2. Bowlby's Working Model Specific to Middle Childhood and Onwards .....	84
7.4.3. Bowlby's Working Model and Adult Models of Attachment.....	86
7.4.3.1. Research Generated from the Self/Other Paradigm.....	89
7.5. Intergenerational Concordance of Attachment Security .....	92
7.6. Attachment and the Development of Distress Disorders .....	92
7.7. Attachment and Child Temperament .....	94
7.8. Attachment and Parent Vulnerabilities, Parenting Styles and Support .....	96
7.9. Chapter Summary .....	97
Chapter 8. MATERNAL CAREGIVING AND PARENTING STYLES THAT PROVIDE RISK AND PROTECTION FOR THE DEVELOPMENT OF CHILDHOOD DISTRESS.....	99
8.1. Chapter Overview .....	99
8.2. Barlow's View of Parenting Styles related to Psychological Risk for Distress .....	99
8.3. Parent Caregiving: The Role of the Maternal Caregiving System .....	101
8.4. Development and Manifestation of the Caregiving System .....	102
8.5. Cognitive and Emotional Components of the Caregiving System .....	103
8.6. Maternal Sensitivity as a Construct Related to Protection .....	104
8.7. Defining the Parenting Styles related to Distress .....	107
8.7.1. Research related to Psychological Control, Rejection and Distress .....	109
8.7.1.1. Early Retrospective Offspring Studies.....	109
8.7.1.2. Cross-sectional Research .....	110
8.7.1.3. Longitudinal Research.....	111
8.7.1.4. Direct Observation.....	113
8.8. Parenting in Middle Childhood.....	116
8.9. Parenting Styles and Perceptions of Control.....	117

8.10	Parenting Styles, Perceptions of Control and Distress .....	120
8.11.	Parental Psychological Control and Rejection: Risk for Healthy Development .....	121
8.12.	Chapter Summary .....	124
Chapter 9. FAMILY FACTORS RELATED TO VULNERABILITY FOR DISTRESS .....		125
9.1.	Chapter Overview .....	125
9.2.	Transmission of Distress within Families.....	125
9.3.	Family Models and their History.....	127
9.4.	The Nature of the Family .....	129
9.5.	Middle Childhood Children as being more Affected by Family Dynamics.....	131
9.6.	Measuring Perceptions of General Family Functions .....	132
9.7.	Research Using this Measure and Related Constructs.....	134
9.8.	Individual Family Constructs and Adaptability or Psychopathology .....	137
9.8.1.	Family Cohesion alone and in combination with Conflict as Risk .....	137
9.8.2.	Family Enmeshment as a Risk Factor.....	138
9.8.3.	Family Conflict as a Risk Factor .....	139
9.8.4.	Family Sociability as Risk .....	141
9.9.	Family Systems and Cultural Interpretation .....	142
9.10.	Chapter Summary and Conclusion.....	143
Chapter 10. PERCEIVED CONTROL AS A CENTRAL COGNITIVE CONSTRUCT IN THE DEVELOPMENT OF DISTRESS DISORDERS.....		145
10.1.	Chapter Overview .....	145
10.2.	Control Perceptions and Biological and Environmental Vulnerabilities.....	145
10.3.	The Role of Perceived Control in Barlow's Aetiological Model of Distress .....	148
10.4.	Control in the Literature .....	149
10.5.	Perceived Control vs. Actual Control: What does it Matter .....	150
10.6.	Theories of Perceived Control and Related Conceptualisations .....	151
10.6.1.	Perceived Competence as related to Distress and Self-Esteem .....	152
10.6.1.1.	Developmental Changes in Competence Beliefs .....	154
10.6.1.2.	Domains of Competence .....	155
10.7.	Framework for Multidimensional Integrated Models of Perceived Control .....	157
10.7.1.	Multidimensional Conceptualisations of Perceived Control .....	158
10.7.2.	Weisz's Control, Competence and Contingency Model of Perceived Control .....	159
10.8.	Antecedents of Perceived Control in Relation to Distress.....	165
10.8.1.	Animal Models Relating Antecedents of Perceived Control to Distress .....	165
10.8.2.	Family Antecedents of Perceived Control and Distress in Humans.....	167
10.8.3.	The Development of Control-related Cognitions.....	168
10.9.	Control Cognitions as Mediators or Moderators of Distress Development .....	173
10.10.	Perceived Control and Competence as Foundations for Resilience to Stress .....	174
10.11.	Chapter Summary .....	176
Chapter 11. DEVELOPING A BIOPSYCHOSOCIAL AETIOLOGICAL MODEL OF DISTRESS DISORDERS IN CHILDREN .....		179
11.1.	Primary Goals of the Study .....	179
11.1.1.	Assessment of an Interactive Biopsychosocial Model of Distress in Children .....	181
11.1.2.	Issues in Need of Examination .....	182
11.2.	Tools to Examine the Model.....	184
11.2.1.	Baron and Kenny's Test for a Mediator Factor or Variable .....	184
11.2.2.	Structural Equation Modelling to Construct and Assess Models .....	185
11.3.	Model Building .....	188
11.3.1.	Model 1: Replicating Chorpita, Brown and Barlow's Model.....	189
11.3.2.	Model 2: Expanded Replication to include General Biological Vulnerability .....	190
11.3.3.	Consolidation of the Predictor Variables .....	191
11.3.4.	Model 3: Hypothetical Model including Other Related Theories.....	193

11.3.5.	Operationalising the Hypothesised Models .....	193
11.4.	Hypotheses.....	197
11.5.	Chapter Summary .....	199
Chapter 12.	METHOD.....	201
12.1.	Chapter Overview .....	201
12.2.	Participants.....	202
12.3.	Measures.....	204
12.3.1.	Child Self-Report Measures .....	205
12.3.1.1.	Measures of Negative Affect.....	205
12.3.1.2.	Child Relationship Measure.....	207
12.3.1.3.	Child Perception of Family Environment Measures .....	208
12.3.1.4.	Child Perceived Sense of Control and Competence Measures .....	211
12.3.2.	Parent-Report Measures .....	215
12.3.2.1.	Measures of Caregiver Availability .....	215
12.3.2.2.	Measures of Caregiver Perception of Child Temperament and Behaviour .....	217
12.3.2.3.	Measure of Caregiver Perception of Family Environment .....	219
12.4.	Procedure.....	220
12.4.1.	Initial Procedure .....	220
12.4.1.1.	Pilot.....	220
12.4.1.2.	Initial Contacts .....	221
12.4.2.	Administration .....	222
12.4.2.1.	Administration of Child Measures.....	222
12.4.2.2.	Administration of Parent Measures.....	223
12.5.	Design and Plan of Analysis .....	224
12.5.1.	Design .....	224
12.5.2.	Pre-analysis data screening .....	224
12.5.3.	Summary of Model Assessment and Development Strategy.....	226
Chapter 13.	RESULTS.....	229
13.1.	Chapter Overview and Study Purpose.....	229
13.2.	Steps for Determining the Indicator Variables to be Used .....	230
13.2.1.	Univariate Correlation of Variables.....	230
13.2.2.	Factor Analysis of Predictor Variables.....	232
13.3.	Structural Equation Modelling Analyses.....	235
13.3.1.	Measurement Model .....	235
13.3.2.	Analyses of Structural Models.....	238
13.3.2.1.	Model 1: Replicated Mediation Model .....	238
13.3.2.2.	Model 2: Two Parts of Barlow's Theoretical Mediation Model .....	242
13.3.2.3.	Model 3: Complex Biopsychosocial Risk Model Analyses .....	245
13.3.2.4.	Complex Model with Perceived Control as Cognitive Factor and Both Family Factors .....	246
13.3.2.5.	Complex Model with Perceived Competence as Cognitive Factor and Both Family Factors.....	250
13.3.2.6.	Lack of Support as Family Factor and both Perceived Control and Perceived Competence as Cognitive Factors.....	253
13.3.2.7.	Family Control as Family Environment Factor with Both Perceived Control and Perceived Competence as Cognitive Factors.....	255
13.3.2.8.	Lack of Family Support as the Family Environment Factor with Perceived Control as Cognitive Factor.....	257
13.3.2.9.	Lack of Family Support as Family Factor and Perceived Competence as Cognitive Factor .....	260
13.3.2.10.	Family Control as Family Factor and Perceived Control as Cognitive Factor .....	262
13.3.2.11.	Family Control as Family Factor and Perceived Competence as Cognitive Factor .....	264

13.3.2.12.	Combining All Constructs in a Complex Biopsychosocial Model of Vulnerability and Protection .....	267
13.3.3.	Comparing the Complex Biopsychosocial Model with a Theoretical Alternative.....	272
13.4.	Summary of Findings .....	275
Chapter 14.	DISCUSSION.....	277
14.1.	Chapter Overview .....	277
14.2.	Summary of Major Study Findings.....	277
14.3.	Replication .....	281
14.4.	Replication and Extension (Theoretical Model) .....	283
14.5.	Biopsychosocial Risk Model.....	284
14.5.1.	Cognitive Mediators in the Model.....	287
14.5.2.	The Social Domain within Perceptions of Control and Competence .....	289
14.5.3.	Family Environment Factors in the Model.....	290
14.5.4.	Parent Personal and Child Temperament Vulnerabilities in the Model.....	292
14.5.5.	Developmental Issues regarding the Biopsychosocial Model .....	293
14.5.	Interpretation and Implications .....	294
14.7.	Strengths and Limitations .....	297
14.8.	Recommendations for Future Research .....	302
14.9.	Conclusions .....	304
REFERENCES.....		309
APPENDICES		
APPENDIX A:	Participant Information Sheets and Consent Forms .....	353
APPENDIX B:	Gray's Neurobiological Theory of Behavioural Inhibition <i>and</i> Adult Models of Attachment.....	359
APPENDIX C:	Conceptualisations related to Perceived Control .....	365
APPENDIX D:	Notes about Further Results Analyses .....	375

## LIST OF TABLES

Table 12.1	Demographic Characteristics of Study Participants .....	204
Table 13.1	Correlation Matrix of Observed Variables .....	231
Table 13.2.	Rotated Factor Matrix of Predictor Variables.....	234
Table 13.3.	Measurement (Confirmatory) Model Analysis: Standardised and Unstandardised Path Coefficients with Critical Ratio Values .....	237
Table 13.4.	Measurement (Confirmatory) Model Analysis: Latent Factor Intercorrelations.....	237
Table 13.5.	Fit Statistics for the Models .....	276

## LIST OF FIGURES

Figure 1.1.	Hypothesised Theoretical Relationships between Biological, Psychological and Cognitive Factors in Distress Development .....	6
Figure 7.1.	Model of Adult Attachment .....	88
Figure 11.1.	Hypothesised Replicated Mediation Model.....	190
Figure 11.2.	Two Vulnerabilities of Barlow's Theoretical Model.....	191
Figure 11.3.	Hypothesised Theoretical model of Anxiety and Depression Development with All Possible Variables.....	196
Figure 13.1.	Path Diagram of the Replicated Mediation model using More Precise Measures .....	239
Figure 13.2.	Path Diagram of the Replicated Model Adding Child Temperamental Emotionality and Shyness.....	243
Figure 13.3.	Path Diagram of the Complex Model of Distress Development Adding a Parent Vulnerabilities Factor, Two Family factors and Perceived Control as Cognitive Factor .....	247
Figure 13.4.	Path Diagram of the Complex Model of Distress Development With Perceived Competence as Cognitive Factor .....	251
Figure 13.5.	Path Diagram of the Complex Model of Distress Development with Lack of Support as Family Factor and Perceived Control and Perceived Competence as Cognitive Factors.....	254
Figure 13.6.	Path Diagram of the Complex Model of Distress Development with Family Control as Family Factor and Perceived Control and Perceived Competence as Cognitive Factors.....	256
Figure 13.7.	Path Diagram of the Complex model of Distress Development with Lack of Support as Family Factor and Perceived Control as Cognitive Factor.....	259
Figure 13.8.	Path Diagram of the Complex model of Distress Development with Lack of Support as Family Factor and Perceived Competence as Cognitive Factor .....	261
Figure 13.9.	Path Diagram of the Complex Model of Distress Development with Family Control as Family Factor and Perceived Control as Cognitive Factor .....	263
Figure 13.10.	Path Diagram of the Complex model of Distress Development with Family Control as Family Factor and Perceived Competence as Cognitive Factor .....	266
Figure 13.11.	Path Diagram of the Final Complex model of Distress Development with Perceived Control and Perceived Competence as Cognitive Factors .....	270
Figure 13.12.	Theoretical alternative to the Final Complex Model of Distress Development .....	274

## **CHAPTER 1.**

### **INTRODUCTION AND OVERVIEW**

#### **1.1. Chapter Overview**

This chapter begins by briefly introducing the topic of this dissertation within the present world context. It then briefly outlines the research study and discusses the content of the following chapters.

#### **1.2. Identifying the Climate where a Model of Distress Disorder Aetiology Fits**

"The tapestry of influence [on the infant and child] is woven from constitutional factors in the baby, personal characteristics of parents and family atmosphere, neighbourhood and social influences as well as host factors such as gender, ethnicity and nationality" (Balbernie, 2002, p.330).

"Psychopathology in children arises from the complex, multilayered interactions of specific characteristics of the child (including biological, psychological and genetic factors), his or her environment (including parent, sibling and family relations, peer and neighbourhood factors, school and community factors and the larger social-cultural context) and the specific manner in which these factors interact with and shape each other over the course of development" (Report for the US Surgeon General in 2002, Ch 3).

"Positive/negative experiences in different settings tend to have a cumulative effect...[as] a child with normal birth weight and secure family relationships is more likely to experience healthy mental and social development, which in turn helps them to adapt to and achieve at school and make friends...[meaning that] it is important to invest in children and families...in the crucially important first five years ...[so that] gains from early investment ...[can] grow over time." (New Zealand's Agenda for Children, report developed by the Ministry of Social Development & the Ministry of Youth Affairs, 2002, p.16)

"...the development of psychopathological conditions ....is complex, not simple; the causes are multivariate, not univariate. An important challenge for researchers is to disentangle the thorny relations...in an effort to improve our understanding about the development and prediction of pathological anxiety."(Silverman and Weems, 1999, pp.246)

"Despite the explosion of studies assessing relations between various contextual factors and various forms of psychological disturbance, about the only firm conclusion one can draw regarding the environment's role in the development of psychopathology is that "bad" things have "bad" effects among some—but not all—people, some—but not all—of the time." (Steinberg & Avenevoli, 2000, p.66)

These statements, from both research and a government policy documents, reflect major advancements in common thinking and psychological research in several ways. First, whereas past explorations were conducted within a single discipline more recently there has been an incorporation of ideas and findings from multiple fields of research. Second, these statements acknowledge the importance of considering both nature and nurture when looking at healthy psychological and physical growth in children. Third, these statements emphasise complexity. Indeed, as reflected in the Youth Ministry statement, messages of complexity are getting across to New Zealand legislators. They also suggest a current need to understand these complex relationships better.

Although most of these statements were made about child development and the development of psychopathology in general, they also apply to the aetiology and maintenance of the distress disorders (i.e., anxiety and mood disorders; Clark, Watson & Mineka, 1994), the topic of the present dissertation. Recent research has suggested that anxiety may be more pervasive and enduring than previously thought (Goisman et al., 1998; Keller & Baker, 1992; Keller et al., 1992; Lonigan & Phillips, 2001; Orvaschel et al., 1995). Barlow (2000) emphasised that "anxiety disorders are shockingly common, far exceeding the prevalence of affective disorders...and...may last for decades or even a lifetime in the absence of effective treatment, making them among the most chronic of the mental disorders" (p. 1248). Chorpita and Barlow (1998) have argued further that anxiety may be central to the development of other negative emotions (e.g., depression). More importantly, they argue that a child's early experiences of

a sense of uncontrollability over events increases the probability that anxiety will develop, especially in the child who is also biologically predisposed.

Research in the area of anxiety development appears also to be moving in a more collaborative direction. There is a growing acceptance that multidisciplinary information-sharing is necessary to further knowledge. For example, findings from animal studies on conditioning (e.g., Mineka, 1985; Mineka & Zinbarg, 1996; Sapolsky, Alberts & Altman, 1997), from neuroscience on neuron growth (e.g., Kandel, 1983) from research in human neurophysiology (e.g., Davidson, 2000; Gray, 1982, 1990; Gray & McNaughton, 1996) have all supported the notion that environmental adversity and enrichment can cause permanent changes in structures of the brain (Nelson, 2000). Such findings have converged with more traditionally studied areas, including attachment (Bowlby, 1969), behavioural inhibition (e.g., see Kagan, 1998 for review), and risk and resilience (Masten & Coatsworth, 1998; Sameroff, Seifer & Zax, 1982) to extend models of anxiety development.

More technological developments have also aided research into anxiety. The advancement of neurobiological assessment techniques (e.g., MRI and ECG scanning, EEG profiling, increasing understanding of the neurochemistry of the brain; Davidson, 2000), the growing sophistication of statistical processes (e.g., structural equation modelling) and behavioural genetics research (Plomin & Caspi, 1999) have been invaluable to the field. These advances have allowed for the testing of multiple predictors and have facilitated links between environmental and individual characteristics in the aetiology and natural course of disorders, including anxiety and depression. The developmental psychopathology perspective has facilitated the collaboration between disciplines to offer an integrative framework to promote better understanding of the aetiology and course of disorders. This collaboration has also allowed for the sharing of more specific clues to

strategies for the prevention of disorder development in vulnerable children as well as for targeted intervention once disorder has developed.

As mentioned, a number of theorists contend that there is no longer the luxury of single variable, single discipline study. The combination of multiple constructs from psychology, sociology, psychopathology, genetics and neuroscience will likely produce more effective means by which to understand the key components of disorder development (Barlow, 2000; Silverman & Weems, 1999). In the area of preventive intervention research, Lorion, Myers, Bartels and Dennis (1994) suggest that developmental sciences have a major role in assessing risk, determining the likelihood of outcomes both positive and negative, as well as informing intervention designers about the salient targets for treatment.

Within the context of multiple influences and the increasing interest in the study of anxiety and depression aetiology in children, a biopsychosocial model of the development of distress disorders is presented. This is briefly discussed in the following section and further elaborated in Chapter 11.

### **1.3. Overview of the Research to be undertaken**

The present thesis is focused on the development of a biopsychosocial aetiological model of distress in children. This model is an extension of an aetiological model proposed by Chorpita and Barlow (1998), tested in a limited way by Chorpita, Brown and Barlow (1998) and elaborated further in a book by Barlow (2002). Essentially, these theorists and researchers have proposed that anxiety and depression occur when a general biological vulnerability to distress (temperamental shyness and emotionality) combines with a general psychological vulnerability (a perceived sense of uncontrollability from early experiences of unpredictability and uncontrollability) and a later specific psychological vulnerability (i.e., specific learning of what is dangerous; e.g., fear of internal body sensations leading

to panic disorder). Central to this model is the perception of control. If a child is able to feel some control in their life, they are thought to be better able to overcome biological and environmental adversity. Chorpita and Barlow (1998) emphasise the importance of having an early sense of control as there is a developmental sequence that is proposed for these cognitive perceptions. They propose that in children before puberty, perceptions of control can change with experiences of control as their beliefs about life are not fully formed. Therefore, developing a sense of control can protect against the possibility of anxiety or depression development. During adolescence and adulthood, however, when beliefs have been more engrained, the theory asserts that feelings of control can not divert distress but can only diminish the intensity of its effect. These individual components will be discussed in more detail in the pertinent chapters to follow.

Because of the study's cross-sectional design, the age and nonclinical nature of the sample and the emphasis on general rather than specific symptom manifestation, the current biopsychosocial model incorporates the general biological and psychological components but does not assess the specific psychological vulnerability of Barlow's theory (i.e., the specific features that determine the specific content of distress-related functioning; see also Chapters 6 & 11). However, despite the fact that this component is outside the scope of the current study, the study is intended to be the most comprehensive test to date of this model. The present biopsychosocial model of distress disorder development also extends the research of Chorpita, Brown, and Barlow (1998) who assessed the role of control-related perceptions in relationship to a general controlling family environment and anxiety and depression in middle childhood<sup>1</sup>. It incorporates risk, protection and developmental considerations within the framework of developmental psychopathology. Included in this model are both biological and

---

<sup>1</sup> In this thesis, the terms middle childhood, preadolescence and latency aged children are used interchangeably.

psychological risk factors for the development of distress disorders in children. Biological risk includes the child’s temperamental emotionality and shyness. General environmental risk for the child encompasses the parent’s temperamental anger, fear and anxiety, attachment security of both parent and child, psychologically controlling and rejecting parenting and the general family environment conditions of lack of cohesion, conflict, family enmeshment, lack of democratic problem-solving, and lack of family sociability. The cognitive constructs of perceived control and perceived competence are seen as protective factors which potentially mediate these risks in relation to the development of distress in children. For clarity and to provide a conceptual map for the reader, a preview of the hypothesised causal relationships between the main variables in the study is presented in Figure 1.1.

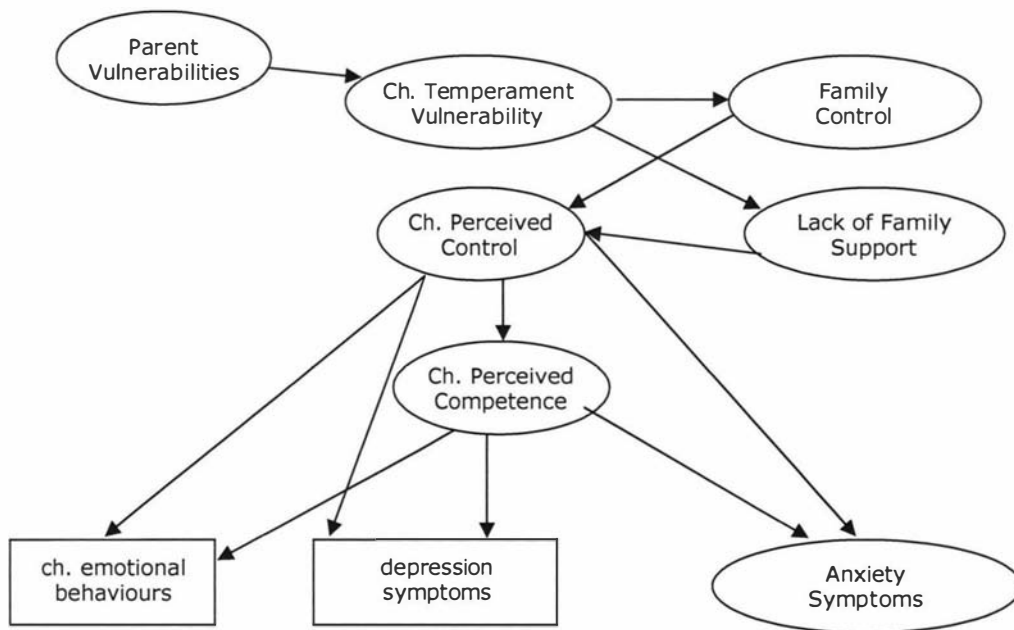


Figure 0.1 Hypothesised Theoretical Relationships between Biological, Psychological and Cognitive Factors in Distress Development

### 1.4. Outline of Chapters to Follow

The following chapters review more closely aspects of the literature which directly pertain to the present study. Chapter 2 defines and discusses anxiety and fear and reviews why the study of anxiety and related disorders

in children is important. Chapter 3 provides a discussion about the broadband construct of Negative Affectivity and how, within that construct, anxiety features in the development of depressive disorders. It is also argued that the two disorders may be considered together, with children, as it may be difficult to differentiate conclusively between them. Chapter 4 presents a framework for the discussion of the risk and protective factors related to anxiety and depression.

Then, Chapters 5 through 10 describe the individual components of the model of distress disorder development proposed by David Barlow (1988, 2000, 2002; Chorpita & Barlow, 1998; Chorpita, 2001), extended by others (Manassis & Bradley, 1994; Vasey & Dadds, 2001) and finally extended again in the present study. More specifically, Chapter 5 explains the first component of Barlow's model of anxiety aetiology and how early temperamental difficulties pose a risk for the development of anxiety and depression in children. Chapter 6 provides a general introduction to the environmental components of Barlow's aetiological model of distress disorder development and relates other recent models to them. Next, Chapter 7 provides a discussion of the attachment relationship which is the first encounter a child has with their environment and which appears to provide risk or protection for the success of other future relationships. Chapter 8 explores the parent-child relationship from the viewpoint of how parental reactions and parenting styles affect a child's risk for developing anxiety and depression. In Chapter 9, other general family environmental factors are discussed in relation to risk and protection against distress disorders. Finally, Chapter 10 discusses the cognitive components of perceived control and perceived competence and how they relate to the development of distress symptoms in children. Following the discussion of these individual components of the proposed model, Chapter 11 presents the rationale and scope of the present study along with the research hypotheses. Chapter 12 reports the methodology while Chapter 13 presents the results of the present study. Finally, Chapter 14 provides a discussion of the present

research findings, limitations of the present research and implications for theory, intervention and future research.

## **CHAPTER 2.**

### **DEFINING ANXIETY IN CHILDREN**

#### **2.1. Chapter Overview**

Because the biopsychosocial model of distress disorders proposed in this study is focused initially on anxiety, this chapter explores why it is necessary to study the development of anxiety disorders in children and how to distinguish them from fears that are normal. First, the nature and function of adaptive fear and anxiety is discussed. Next, maladaptive anxiety is explored, including issues of prevalence, comorbidity and problems of early identification. The consequences of not detecting problems early, prognosis and remittance information are also included.

#### **2.2. Fear and Anxiety**

Researchers have suggested that it is essential first to understand the normal course of anxiety in order to understand what is not normal (Ronan, 1996; Ronan & Deane, 1998). During the normal developmental course of life, fears and anxiety are seen as appropriate responses to everyday situations of real or imagined threat (Morris & Kratochwill, 1983). They are experienced by everyone from time to time. For children, they are required for them to be able to develop the skills necessary to protect against and cope with inevitable future stress (Kendall, Chansky et al., 1992; Ronan, 1996; Ronan & Deane, 1998). Almost 100 years ago, Yerkes and Dodson (1908, cited in Hussain & Kashani, 1992) demonstrated that a moderate amount of anxiety enhanced performance of animals doing simple tasks and appeared to inoculate them against future adversity.

Both fear and anxiety may be considered adaptive as animals and children learn either directly through experience or indirectly from the teachings or

observation of adults and peers (Bouton, Mineka & Barlow, 2001). Maladaptive anxiety differs from normal anxiety in its intensity, duration and its relationship to psychosocial functioning at the most basic, everyday level (Ronan & Deane, 1998). When fear or anxiety reach levels that impact in a major way on a child's life (e.g., continuous school refusal or obvious difficulties in facing social situations), they may develop into a psychological disorder. If left unattended, childhood anxiety disorders can lead to further problems in later life (Last et al., 1996; Ollendick & King, 1994; Orvaschel, Lewinsohn & Seeley, 1995).

### **2.2.1. Adaptive Anxiety**

Philosophers for centuries have emphasised the importance of anxiety in avoiding harm or death and in facilitating creativity and striving for excellence. Leonardo Da Vinci (1500) said "Just as courage imperils life, fear protects it." Some have considered anxiety to be at the base of the meaning of life. An Arab philosopher from the 11<sup>th</sup> century described anxiety as a universal basic condition of human existence (Kritzech, 1964). Kierkegaard (1844, cited in Barlow, 2002) indicated in his 19<sup>th</sup> century work that to "go forth" caused anxiety. He saw anxiety as a human response directed at reducing or destroying aggression, fatigue, boredom and death and as "the being affirming itself against nonbeing" (pp. xv). Rollo May (1979) concluded that, "the positive aspects of selfhood develop as the individual confronts, moves through and overcomes anxiety-creating experiences" (pp. 393). Freud (1926/36) saw 'angst' as functioning to warn the person of possible danger and trigger the activation of internal psychological defence mechanisms to protect the individual's integrity and allow for a higher, more mature level of functioning. He suggested that anxiety could even elicit aid from others when the danger was real. Although Freud would say that the defensive reactions could lead to symptom formation if they were inadequate, more often they were adaptive.

### **2.2.1.1. Adaptive Fears, Development, Gender, Social Status and Culture**

Most non-clinical childhood fears occur consistently at different developmental stages. Infants experience largely immediate, concrete fears and older children progress to abstract, anticipatory fears (Gullone, 2000). Infants are afraid of loud noises, loss of physical support and unfamiliar people. Young children experience fears of small animals, imaginary creatures, dark places and, at about six or seven, fears concerning failure at school. While the external fears like those of supernatural events and the dark tend to decline with age (Miller, 1983), the school fears tend to persist into later childhood when more abstract and anticipatory fears like social acceptability and fear of physical injury become more prominent (Silverman, La Greca & Wasserstein, 1995). Adolescents tend to report more internally focused social fears than younger children (McGee, Feehan, Williams & Anderson, 1992).

The overall numbers of fears tend to decrease with age. However, those scoring either above or below the norm at a young age tend to continue to do so over time, suggesting a trait-like aspect to fearfulness (Gullone & King, 1997). This finding is consistent with earlier findings that Behavioural Inhibition, a construct related to anxiety, persists over time (Kagan, 1989). This topic will be discussed in a later chapter (see Chapter 5).

Girls tend to report a greater number of fears than boys (Burnham & Gullone, 1997) and report a greater intensity of response (Gullone & King, 1997). However, this reporting could be affected by 'report bias' as boys, because of sociocultural factors, may be more reluctant to admit their fears (Ollendick, Matson & Helsel, 1985). Boys report being more afraid of injury to their body, the pressures of "being good", getting into trouble, nightmares and imaginary creatures. Girls are more fearful of the dark, strange sights and sounds, loneliness, personal relationships and being kidnapped, killed or

robbed (Jersild, Markey & Jersild, 1933; Poznanski, 1973, both cited in Gullone, 2000).

Earlier research indicated that those children from a lower socio-economic status (SES) tended to report more fears than their higher SES counterparts (Sidana, 1967). By contrast, Fonesca, Yule and Erol (1994) reported that those from lower SES groups had fewer fears than their higher SES counterparts. Thus, findings here are inconclusive.

Regarding different cultures, King et al. (1989) found almost identical fears in Australian and American children. More generally, studies from 'Western' countries have tended to report consistent findings of fear frequency and content particularly concerning the theme of death and danger. Consistency across studies has also been noted for gender differences and developmental patterns (Gullone, 2000).

A cross-cultural study (Ollendick, Yang, King, Dong & Akande, 1996) has found a positive association between cultural practices that favour self-control, social inhibition and compliance with social norms (i.e., high power distance and low individualism; e.g., Asian and Latin American countries; Hofstede, 1980 cited in Gullone, 2000) and internalising problems (i.e., anxiety, depression and fear). As well as suggesting cultural bias, it also may help to explain possible within-culture influences in the socialisation of fear.

### **2.2.2. Maladaptive Anxiety**

Historically, Emminghaus (1887; cited in Husain & Kashani, 1992) labelled maladaptive anxiety in children as "neurasthenia cerebri". He included such symptoms as withdrawal, oversensitivity, tearful apprehension and psychosomatic symptoms. He suggested that this state was a result of 'neural exhaustion, parental severity and parental projection of

overambitiousness to the child' (Husain & Kashani, 1992, pp.1). At the beginning of the 20<sup>th</sup> century, two very different views concerning the origins of fears, phobias and anxiety states were suggested-- one by Freud (1926/36) and the other by Pavlov (1927, cited in Husain & Kashani, 1992) and Watson (Watson & Rayner, 1920, cited in Husain & Kashani, 1992).

Freud's case study of the treatment of Little Hans' fear of horses was taken as support for the psychoanalytic view that anxiety signalled the need to repress infantile wishes of the id—or the fear of the disastrous consequences that were expected if a previously punished id impulse was allowed to be expressed (1895, cited in Husain & Kashani, 1992). Although generally accepted and containing a number of observable concepts, Freud's theories have not been able to be empirically tested directly (Wolman & Stricker, 1994), but they have been able to stimulate a lot of research on anxiety (Freud, 1926, cited in Wolman & Stricker, 1994).

Watson and Rayner's (1920) study of fear induction in Little Albert and Jones' (1924 cited in Husain & Kashani, 1992) treatment of 3-year-old Peter's fears of furry animals provided empirical evidence supporting the emerging theory of behaviourism. Pavlov and Watson believed that fears and anxiety disorders arose from what is now known as classical conditioning: previously neutral objects or situations can acquire fear-eliciting-potential when coupled with traumatic events. The seminal example of this was the installation of a fear of white rats into a small child, 'Albert B' by conditioning techniques. This phobia became generalised to a dog, a fur coat and then a Santa Claus beard (Watson & Rayner, 1920). Pavlov (1927) contributed to this view by inducing 'anxiety neuroses' in a dog (Pavlov, 1927, cited in Husain & Kashani, 1992). More recently, the principles of cognitive psychology (e.g., information processing, cognitive appraisal) have been combined with those of behaviourism. This combination along with other developments discussed later, has created a

potentially more comprehensive aetiological model of adaptive and maladaptive fears and anxieties.

#### **2.2.2.1. Presentation of Maladaptive Fear and Anxiety**

In current times, fear and anxiety have been defined as “apprehension, uneasiness or tension related to the expectation of internal or external threat” (Kendall, Chansky, et al., 1992, p.1). Physiologically, anxiety manifests as heart palpitations, muscle tension and trembling, perspiration, headaches, stomach aches, nausea or even vomiting (Kendall, Chansky et al., 1992). Behaviourally, anxiety presents as restlessness, a shaky voice, crying and avoidance of the anxiety-producing stimulus (Huberty, 1997). From the cognitive/affective perspective, anxiety and fear produce subjective feelings of apprehension and uneasiness and a sense of being threatened or not being in control. In more severe instances, a feeling of being overwhelmed with an inability to control the situation before them (Chorpita & Barlow, 1998) may lead to thoughts of impending death or insanity (Bourne, 1990). Further, cognitive functions like attentional focus and memory are affected by anxiety (see Alfano, Beidel & Turner, 2002 for review) and distorted thinking can lead to further distress in anxious children (Weems, Berman, Silverman & Saavedra, 2001). While animal evidence suggests that uncontrollable and unpredictable stress early in life can lead to chronic anxious apprehension, instillation of a sense of control or mastery during development appears to protect against overly anxious responding (Dienstbier, 1989; Mineka, Gunnar & Champoux, 1986).

More recent neurological research results have differentiated fear from anxiety. It appears each state manifests from different neuropathways in the brain (Barlow, 2002; Craske, 2001). These findings have corroborated behavioural observations that fear is a response to a discrete, external stimulus, often involving the behavioural response of ‘fight or flight’ (Barlow, 2000). Fear is seen to encompass phobias, where a fearful object, situation

or activity can be identified as producing the reaction (see Barlow, 2000, 2002 for review). Anxiety is more general and anticipatory and is often an internal reaction to what may possibly happen in the future (Barlow, 1991). In fact, it is suggested that anxiety may more appropriately be referred to as anxious apprehension because of the future focus (Barlow, 1988, 2000, 2002). In contrast to fear, anxiety has been considered by many diverse theorists (Cloninger, 1986; Hallam, 1985; Izard, 1977; Izard & Blumberg, 1985; Lang, 1985) to include a more complex blend of emotions and cognitions (Craske, 1999). These include imagination, abstraction and internalised threat and uncertainty (Barlow, 2002). Despite their differences, fear and anxiety have generally been considered together in the clinical child and adult literatures (Wolman & Stricker, 1994). One reason certainly is the similarities in presentation. In addition, treatment strategies for fear and anxiety in children are quite often similar (Kendall & Ronan, 1990).

#### **2.2.2.2. Diagnosis and Classification of Childhood Anxiety**

It can, at times, be difficult to determine where the boundary between adaptive and maladaptive fears and anxieties lies. The prevalence of fears and anxieties in normal childhood development along with their transitory nature make this line difficult to find (Gullone, 2000; Vasey & Dadds, 2001). Huberty (1997) has noted that there have been no substantive guidelines provided by the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV; American Psychiatric Association [APA], 1994), and it remains to the practitioner's judgement as to when anxiety has attained disorder level. Miller, Barrett and Hampe (1974) suggested the following criteria: whether the fear or anxiety persists over an extended time period; whether it is out of proportion to the situation and is unreasonable; whether it appears to lead to a lack of voluntary control over avoidance; whether it is age or stage appropriate and whether it interferes significantly with everyday life. The last of Miller et al.'s (1974) criteria (i.e., the interference criterion) is seen

by the DSM-IV (APA, 1994) to be most salient in deciding whether treatment is appropriate.

It was not until 1966 that anxiety disorders in children were classified by the Group for the Advancement of Psychiatry (Hussain & Kashani, 1992) with DSM-II (American Psychiatric Association, 1968) having only one condition, "overanxious reaction of childhood or adolescence". DSM-III and DSM-III-R (American Psychiatric Association, 1980, 1987) had anxiety disorders of childhood and adolescence under three broad categories: anxiety disorder, avoidant anxiety disorder and overanxious disorder. The most recent revision of the *Diagnostic and Statistical Manual* (DSM-IV; American Psychiatric Association, 1994) has reclassified childhood anxiety, thus leading to confusion when comparing prevalence studies. What were known as avoidant and overanxious disorders have now been classified as social phobia and generalised anxiety disorder (GAD) respectively to fit with the adult classifications. Although not child-specific, each contains specific features related to childhood symptom manifestation such as requiring a reduced number of symptoms to make a diagnosis as well as a greater focus on peers (Ronan & Deane, 1998). Only separation anxiety remains specific to disorders of childhood.

In keeping with developmental differences, younger children tend to present with separation anxiety and simple phobia while older children most often present with social phobia and generalised anxiety disorder (with comorbid depression or dysthymia; Ollendick & King, 1994). Although understanding of specific symptomatology is essential when assessing children for treatment, the focus of the present study is on models of anxiety development. Thus, the details of specific disorders are not covered here.

### **2.2.2.3. Prevalence, Comorbidity, Age and Sex Differences**

Community epidemiological studies provide strong evidence that anxiety disorders are the most prevalent type of psychological disorder for children and adolescents (Albano, Chorpita & Barlow, 1996; Bernstein & Borchardt, 1991; Fergusson, Horwood & Lynskey, 1993; McGee et al., 1990; Verhulst, van der Ende, Ferdinand & Kasius, 1997) and that mood disorders appear to be closely linked (see Chapter 3). Recent national and international prevalence estimates using the criterion of functional impairment (i.e., requiring clinical intervention) indicate that 10% to 12% of children suffer from anxiety disorders and 4% to 8% of children suffer from mood disorders (Albano et al., 1996; Barlow, 2002; Bernstein & Borchardt, 1991; Fergusson et al., 1993; McGee et al., 1990; Verhulst et al., 1997).

Comorbidity is seen as a characteristic feature of anxiety disorders in children (Anderson, 1994; Brady & Kendall, 1992; Klein, 1994). A number of studies have found that at least a third of children with an anxiety disorder meet diagnostic criteria for another anxiety disorder (AACAP, 1997). For example, in a sample of clinic-referred youth, Strauss and Francis (1989) found that 50% were diagnosed with specific phobia and 67% of those with social phobia also met the diagnostic criteria for overanxious disorder (now GAD). Klein (1994) warned, however, that these estimates from clinical presentation may be influenced by referral bias or enthusiastic use of diagnostic criteria. However, community studies have found comorbidity among anxiety disorders as well. New Zealand research reported 36-39% comorbidity between anxiety disorders in a large cohort of children (Anderson, et al., 1987) and 17% comorbidity in adolescence (McGee et al., 1990).

Additionally, anxiety disorders are often comorbid with other psychological disorders, the most frequent being the mood disorders (Kendall, 1994; Fergusson et al., 1993; McGee et al., 1990; Ollendick & King, 1994). Last,

Francis et al. (1987) reported one or more disorders comorbid with anxiety at assessment (depression, 100%; ADHD, 25% and oppositional defiant disorder, ODD, 20%). Kendall (1994) reported rates of comorbidity for children attending a treatment programme for anxiety disorders to be 32% for depression, 15% for ADHD and 13% for ODD. New Zealand research has also confirmed that children with either anxiety or mood disorders were also at greater risk for conduct disorders and substance use disorders (Fergusson et al., 1993). In their Christchurch cohort of 965 children, 10.8% met criteria for an anxiety disorder. Of these, 59% qualified for only one diagnosis, 41% met the criteria for at least two diagnoses and 10% met criteria for three or more diagnoses (Fergusson et al., 1993).

As mentioned, comorbidity between anxiety and depression has been more commonly seen in older children and adolescents (Anderson, 1994; Fergusson et al., 1993; Horwood & Ferguson, 1998; McGee et al., 1990). Older children and adolescents with primary generalised anxiety disorder and social phobia presented most often with comorbid depression or dysthymia (Ollendick & King, 1994; Huzziff & Ronan, 1999; Last, Hersen et al., 1987). Fergusson et al. (1993) found that in New Zealand, children with anxiety disorders were significantly more likely to also present with a mood disorder (odds ratio +4.6–4.9). A later report found that of the 226 subjects (16-18 year olds) from this sample who met the criteria for a mood disorder, 95 (42%) had comorbid anxiety (Horwood & Fergusson, 1998). McGee et al. (1990) also reported that anxiety and depression was the most common combination in their Dunedin cohort of fifteen year-old New Zealanders. Further, Orvaschel, Lewinsohn and Seeley (1995) found that more than 60% of their adolescent sample who were primarily diagnosed with anxiety later developed major depressive disorder while the reverse rarely happened (around 6.5% of cases). A number of investigators have found that, in comparison with those suffering from an anxiety disorder alone, those with comorbid anxiety and depression report higher distress on self-report measures (e.g., Francis, 1990; Ronan & Kendall, 1997; Ronan, Kendall &

Rowe, 1994) and suffer greater psychosocial impairment (Horwood & Fergusson, 1998). This is concerning in light of New Zealand evidence that more than 70% of those 14-18 year olds in the Christchurch cohort with mood and anxiety disorders ( $n = 95$ ) reported making at least one suicide attempt (Horwood & Fergusson, 1998).

In addition to what has been presented, preliminary evidence suggests that older children tend to report more symptoms than younger ones (Strauss, 1990). For example, based on a sample of clinic-referred children diagnosed with overanxious disorder, Strauss et al. (1988) found that children and adolescents older than 12 reported a greater number of symptoms, more severe symptoms and higher levels of self-reported state and trait anxiety and depression compared to those under 12 years of age. There also appeared to be developmental differences in the type and severity of the disorders presented at different ages.

A gender bias has been associated with anxiety and mood disorders. In a community study of over 1000 adolescents, Lewinsohn, Gotlib, Lewinsohn, Seeley and Allen (1998) found that 74% of "current" and 65% of "recovered" cases were females as compared to 48% of their "no-disorder" control group. They identified statistically that the comparative female vulnerability to anxiety was more likely based in genetics than environmental factors alone although they could not rule out the possibility. In the Christchurch, New Zealand sample, girls had 2.5 to 4 times the rate of anxiety and mood disorders compared with boys at age 11 (Fergusson et al., 1993). By 16-18, females were 1.9 times more likely than males to have an anxiety disorder and 2.2 times more likely to have a mood disorder (Horwood & Fergusson, 1998).

### **2.3. Problems with Identification of Distress-Prone Children**

A major problem before treating children with distress disorders is the difficulty in identifying them. In the classroom, where children spend a good proportion of their day, the anxious and depressed children tend to be quiet, well-behaved and easily managed (Simeonson, 1994). They are generally more competent, are rated more intelligent and make less of an impact on their environment than their externalising counterparts. Internalising behaviours are also more generally thought to be less stable over time so there has been perhaps less urgency to put resources into detecting them (Cicchetti & Toth, 1997).

Related to this idea, only 21% of the children meeting diagnosable criteria for Axis I disorders from the large Christchurch study were receiving any kind of psychological assistance for their problems (Fergusson, Horwood & Lynskey, 1993; Horwood & Fergusson, 1998). While children with more obvious comorbidities (e.g., disruption/substance abuse) were more likely to be noticed (35% were identified), children with anxiety or mood disorders were not (only 9% were identified). These statistics confirm the general consensus about the potential invisibility of those with internalising disorders (McGee et al., 1990; Offer, Howard, Schonert & Ostrov, 1991).

#### **2.3.1. Consequences of Not Identifying the Anxious Child**

Rubin and Mills' (1991) research has suggested that there are major consequences in not identifying these anxious children early. As these children get older, problems arise. In their conceptualisation of developmental pathways to distress disorders in children, Rubin and Mills (1991; Rubin & Burgess, 2001) have suggested that a child's dispositional characteristics interact with their caregiver's attitudes and beliefs about the child and themselves in the context of the caregiver's experiences of life and stresses. This interaction when dysfunctional (e.g., a clingy child with a preoccupied, unsure caregiver) can produce a child who is insecurely

attached, socially inhibited and unskilled at basic interaction with others. This child in turn may become negatively self-appraising and make decisions not to try new things. These decisions may then lead to further withdrawal and lost opportunities to learn from and gain control over experiences. Barlow (2002; see also Kagan, 1997; Rubin & Burgess, 2001) suggests that parents unwittingly can exacerbate the problem with their own heightened perceptions of threat and low estimations of their child's ability to cope. These beliefs may cause parents to overprotect the child rather than encourage approach-related skills required to gain a sense of mastery, control and competence.

Further consequences may arise in relation to peers. Initially, young peers may be more forgiving of a withdrawn child as they haven't developed the social schemata with which to evaluate that type of behaviour and their focus is more firmly on the aggressive peers whom they are in a better position to judge. However, with age (often by 7 years), peers become more aware of the socially withdrawn children and are more likely to see their behaviour as negative and to reject them (Rubin & Mills, 1988). This process can solidify a growing negative self-perception (Barlow, 2002; Rubin & Mills, 1991).

## **2.4. Prognosis and Remittance**

Those children and adolescents with chronic but untreated anxiety have a significantly poorer prognosis compared to those treated (Dadds, Barrett & Cobham, 1997). Prognosis has been found to be better for acute and early onset anxiety-related problems like school phobia, especially when help for the child is found quickly (Cantwell & Baker, 1989). Keller et al. (1992) studied past and present psychopathology in a large sample of children (6-19 years) whose parents had affective disorders. They found that 14% of the children had a history of an anxiety disorder, 34% of which had not remitted for 4 years. Other research has reported that some children met

diagnostic criteria for anxiety disorders up to 8 years after onset (Kovacs & Devlin, 1998). Further, Last, Perrin, Hersen and Kazdin (1996) found that, in a clinic-referred sample of children, 82% did not meet criteria for the original disorder after 3-4 years, but 30% developed different disorders, including 16% with other anxiety disorders. In addition, a significant number of clinically anxious adults have been found to report generalised anxiety symptoms or separation anxiety as children (Last, Hersen, Kadzin, Francis & Grubb, 1987).

Treatment can help and remittance can occur when treatment is accessed in childhood. Three studies of the treatment of children meeting DSM-IV criteria for an anxiety disorder (Barrett, Dadds & Rapee, 1996; Kendall, 1994; Rapee, 2000) reported that approximately 60% of the children were diagnosis-free after one year of child-focused cognitive behavioural therapy (Barrett, Dadds & Rapee, 1996; Kendall, 1994) and remained so at a five year follow-up (Kendall & Southam-Gerow, 1996). In another study which included a parent-treatment component, more than 84% of the children were diagnosis-free when there was a parent-treatment component (Barrett, Dadds & Rapee, 1996). Further, when Rapee (2000) used a parent/child group treatment protocol involving fewer treatment sessions, he reported results similar to Barrett et al. (1996). By contrast, comorbid disorders have been linked with poorer treatment outcomes in 16 to 18 year olds (Horwood & Fergusson, 1998). It does appear that early intervention with children is a most effective strategy to prevent longer term problems.

## **2.5. Chapter Summary**

Although anxiety in moderation is adaptive and functional, research has confirmed that maladaptive anxiety can be debilitating. Further debilitation comes because anxiety is often comorbid with or followed by other disorders of childhood, most often depression. This strengthens the argument that distress disorders present serious and potentially long-term difficulty for

individuals and their families. Empirical evidence has shown that while there is a poorer prognosis when distress disorders are not detected early, treatment following early detection has been successful in stemming the cumulative social consequences of the disorders. Partially impeding this early intervention is the ability of children, and perhaps their parents, to hide their distress and the general lack of awareness of salient early signs of distress. It appears that neither the mechanisms for detection nor the systems to deal with those who are seen to be struggling have been defined well enough to be useful to those who have the ability to identify problems early at the primary level (e.g., teachers, nurses; New Zealand Agenda for Children, 2002). A greater understanding of the interplay between biological and psychological vulnerabilities to anxiety and depression and the cognitive constructs that make a difference may help in creating socially acceptable primary interventions that may have a long term effect on the future of these vulnerable children.

In order to develop such an interactive model of distress disorder aetiology, it is first necessary to explore the nature of distress disorders. To this end, the general construct of Negative Affectivity is explored in the following chapter.

## **CHAPTER 3.**

### **THE CONSTRUCT OF NEGATIVE AFFECTIVITY—CONNECTING ANXIETY WITH DEPRESSION**

#### **3.1. Chapter Overview**

This chapter focuses on a rationale for why anxiety and depression should be considered together in relationship to a model of distress disorder development. It, first, examines how anxiety and depression are linked genetically, temporally and structurally with theory and research. It then explores whether the two disorders can be differentiated in childhood through measurement and cognitive processes.

#### **3.2. How Anxiety and Depression are Linked**

As mentioned in the introduction, anxiety and depression often co-occur with symptoms shared by both disorders (e.g., concentration difficulties). Chorpita and Barlow (1998) discussed the similarity with the observation that essentially the same pharmacological and psychotherapy techniques were effective with both anxiety and unipolar depression. This suggests that there may be common elements between the disorders despite them being differentiated by symptom manifestation. On the other hand, Clark (1989) defended the difference with the argument that clinically depressed patients tend to report a greater number of anxious and depressive symptoms than do anxiety disordered patients. This could equally be an argument for anxiety and depression being on a continuum of severity. Both clinically depressed adults (Brown, Schulberg, Madonia, Shear & Houck, 1996) and children (Chorpita & Daleiden, 2002; Stark, Humphrey, Crook & Lewis, 1990) tend to appear more disturbed than clinically anxious ones. Within 16-18 year olds, Horwood and Ferguson (1998) reported the extent of

impairment to be high for both depressed and anxious adolescents. Measured by the mean number of areas of impairment reported (school/work, family relations, friend relations, partner relations or other), mood disorders had the highest level of impairment of all disorders measured (3.3) and anxiety disorders were next (2.5). Further, as discussed in Chapter 2, more than 70% of those who had both a mood or anxiety disorder when they were between 14 and 18 attempted suicide (Horwood & Ferguson, 1998). Genetic studies have also linked different features of anxiety and depression. Combining the perspectives of similarity and difference to support comorbidity (Alloy, Kelly, Mineka & Clements, 1990), research has corroborated: 1) a sequential relationship between anxiety and depression; 2) the infrequent presentation of purely depressive symptoms compared with the common presentation of pure anxiety symptoms in patients; 3) a relationship between depression and each of the anxiety disorders.

### **3.2.1. Genetic Links between Anxiety and Depression**

Genetic evidence from epidemiological studies has revealed that Generalised Anxiety Disorder (GAD) and major depression reflect a common genetic diathesis (Kendler, 1996) both strongly related genetically to the personality trait of neuroticism (i.e., poor response to stress with distress and negative affect occurring frequently and intensely; Kendler, Waters, Neale, Heath & Eaves, 1995). To a lesser extent, some other anxiety disorders such as social phobia, agoraphobia and animal phobias also have some genetic relationship with depression whereas others such as situational phobias and OCD apparently do not (Kendler et al., 1993b; Pauls et al 1994). Kendler, Neale, Kessler, Heath & Eaves (1995) found that two genetic factors underpinned major depression, GAD, panic and phobias. While GAD and depression loaded primarily on one factor, panic and the phobias tended to load more heavily on the other factor.

### **3.2.2. The Sequential Relationship between Anxiety and Depression**

Alloy et al. (1990) demonstrated a sequential link between depression and anxiety by integrating findings based on a hopelessness model of depression (Abramson, Metalsky & Alloy, 1989) with research concerning the role of perceived control in anxiety (Barlow, 1988; Mineka, 1985 see Chapter 10 for more detail). They looked at a continuum starting at 'aroused anxiety' (i.e., when a person experienced the inability to control outcomes). Alloy et al. (1990) labelled this as "uncertain helplessness". The next step in the sequence incorporated the idea of 'mixed anxiety-depression' labelled "certain helplessness". The last step of the sequence is depression itself (i.e., perceptions that negative outcomes were certain) labelled "hopelessness" (Alloy et al.). Research evidence has corroborated the temporal asymmetry between anxiety and depression where depression has been observed to follow anxiety (in 62% of cases; Angst, Vollrath, Merikangas & Ernst, 1990). Cases of depression without anxiety are rarely observed while anxiety disorders alone are common (DiNardo & Barlow, 1990; Dobson, 1985; Sanderson, DiNardo, Rapee & Barlow, 1990). Retrospective evidence in an adolescent sample has also supported the temporal notion. Orvaschel, Lewinsohn and Seeley (1995) reported 64.7% of their adolescent sample diagnosed initially with a primary anxiety disorder later presented with a diagnosis of major depression while only 6.5% with a primary major depression presented later with an anxiety disorder. A review of comorbidity between anxiety and depression in children and adolescents (Brady & Kendall, 1992) found further support: anxiety disordered children tend to be younger than depressed children or those with comorbid anxiety and depression. Additionally, across different samples, comorbid and depressed groups tend to be more symptomatic. Anxiety symptoms also tended to predate depressive symptoms in these groups.

A more recent longitudinal study using a community sample of children and adolescents has also been able to establish a temporal relationship (Cole, Lachlan, Peeke, Martin, Truglio and Seroczynski, 1998). Using parent and child self-report measures, two related findings emerged. High levels of child anxiety predicted later increases in child depression over time. However, high levels of child depression did not predict increases in anxiety over time.

The phenomenon that anxiety tends to precede depression both within episodes and across the lifetime appears to have been well supported by many additional studies (Alloy et al., 1990; Avenevoli, Stolar, Li, Dierker & Merikangas, 2001; Brown, Campbell, Lehman, Grisham & Mancill, 2001; Mineka, Watson & Clark, 1998). Consequently, a number of researchers have suggested that anxiety in early life may be a general risk factor for a number of problems including depression (Barlow, 2002, Barlow, Chorpita & Turovsky, 1996; Chorpita & Barlow, 1998).

Finally, attachment theory has also linked anxiety sequentially with depression (Bowlby, 1973, 1980). Bowlby's theory suggests that separation from an attachment figure causes both agitation and despair with anxiety-based responding occurring first. The initial experience of uncertainty around loss is then followed by depression only if the separation continues (Bowlby, 1973, 1980; see also Chapter 7).

### **3.2.3. Structural Models Connecting Anxiety with Depression**

Studies of the structural relationship between anxiety and depression have also confirmed their strong relationship (Barlow, 2002; Brown, Chorpita & Barlow, 1998, Brown et al., 2001; Mineka et al., 1998). Numerous studies (e.g., Chorpita, Plummer, & Moffitt, 2000; Cloninger, 1986; Eysenck, 1981; Gray, 1982) have demonstrated the presence of a non-specific distress factor underlying the disorders of anxiety and depression, variously labelled

Negative Affectivity, non-specific psychological distress and neuroticism (Brady & Kendall, 1992; Lonigan Carey & Finch, 1994). Most often referred to in structural studies as Negative Affect, it includes feelings of anger, fear, guilt and sadness and characteristically includes a tendency towards worry and anxiety, negative attributional style and negative, self-referent cognitions and beliefs (Clark & Watson, 1991). Several models involving Negative Affect have been used to explain the relation between anxiety and depression.

### **3.2.3.1. Two Factor Model**

Early investigations revealed a two factor model (Tellegen, 1985) consisting of Negative Affect (NA; reflecting a person's experience of sadness, anger, fear or guilt) and Positive Affect (PA; reflecting a person's feelings of energy, pleasure, attentiveness, and enthusiasm) related to emotions in general and to anxiety and depression in particular (Tellegen, 1985). Tellegen and subsequent investigators have consistently found evidence that NA is a general, non-specific factor that shares commonality with anxiety and depression while PA is more specifically related to depression. Ronan, Kendall and Rowe (1994) found this relationship also held true with self-statements of children showing that both anxious and depressed children (aged 11-15) endorsed negative self-statements while only the anxious children tended to endorse positive self-statements. Studies using differing methods and older children have also supported this two factor solution (Cole Truglio and Peeke, 1997; Crowley & Emerson, 1996). However, for younger children (7-11 years old), findings from Cole et al. (1997) supported a more unitary model with anxiety and depression being variants within the same construct (see also Jacques & Mash, 2004).

### **3.2.3.2. Tripartite Model**

Clark and Watson (1991) presented an extension of Tellegen's model which they felt more precisely characterised the relationship between anxiety and depression. This extended model introduced Physiological Hyperarousal (PH; with symptoms of hyperarousal and somatic tension such as shortness of breath, dry mouth and dizziness) as a third factor which, they suggested, was specific to anxiety. They theorised that PA and PH related in a hierarchical way to the general NA factor. The symptoms within this NA factor such as poor concentration, irritability and sleep problems were related to both anxiety and depression. Low PA (e.g., anhedonia accompanied by motor and cognitive slowing) was related only to depression while PH was related more specifically to anxiety.

Studies generally have supported a tripartite model (e.g., Chorpita, Albano & Barlow, 1998; Chorpita & Daleiden, 2002; Lonigan, Carey & Finch, 1994; Lonigan, Hooe, David & Kistner, 1999; Stark & Laurent, 2001) with both clinical and community samples of children using differing methods of investigation. These studies have more clearly identified the differences between the NA and PA factors. For example, Lonigan et al. (1994) found, with inpatient children and adolescents diagnosed with anxiety- and depression-related problems, NA was associated with both anxiety and depression. PA distinguished between them, with low PA associated with depression and not anxiety (see also, Chorpita, Albano & Barlow, 1998; Joiner, Catanzaro & Laurent, 1996; Joiner & Lonigan, 2000; Lonigan, Phillips & Hooe, 2003). Support for the unique relationship between PH and anxiety was also found in studies where items from anxiety and depression measures were sorted to represent purely anxious, depressive and physiologically arousing symptoms (Chorpita et al. 1998; Joiner et al., 1996). Chorpita, Plummer and Moffitt (2000) found that anxiety and mood disorder ratings correlated positively to NA while depression, panic and social phobia ratings correlated negatively with PA. While the Joiner et al.

(1996) PH scale correlated positively with panic severity ratings, the Chorpita et al. (1998) PH scale correlated with panic as well as separation anxiety and depression severity. This study pointed out the difficulty of measurement as well as the questionable assumption about PH being a general discriminating factor for all anxiety disorders, particularly in childhood.

### **3.2.3.3. Three Factor Model**

Barlow and colleagues (Barlow et al., 1996; Chorpita, Tracey, Brown, Collica & Barlow, 1997) articulated a three factor model for the relationship between anxiety and depression which helped to explain the relationship of PH to anxiety and depression. With the help of Gray's (1990; Gray & McNaughton, 1996) biological theory, they suggested, that general distress or Negative Affectivity occurred with 'anxious apprehension' (anxiety) and that autonomic hyperarousal (PH) was the manifestation of fear/panic. Anhedonia (as opposed to anxiety in general), including low PA as well as hopelessness were present uniquely with depression. Negative Affectivity was considered to be present with both depression and anxiety while the other two factors were more specific. Barlow (1988, 1991, 2000, 2002; Chorpita & Barlow, 1998) added a developmental component to the theory contending that anxiety and depression shared the same biological vulnerabilities; namely, an overactive neurobiological response to stressful life circumstances and a shared psychological vulnerability derived from the early experiences with uncontrollability. Work with primates by Mineka (1985; Mineka, Gunnar & Champoux, 1986; Mineka & Kihlstrom, 1978) has shown that early lack of control produces later fear and anxiety manifestation. Work by Seligman (1975) on learned helplessness has also demonstrated the relationship between uncontrollability and symptoms similar to depression. This led Barlow (1991) to believe that those individuals who had gone past the point of anxiety to depression (e.g., Alloy's et al., 1990 model, see Section 3.2.2) reacted more severely (feeling

hopeless) to the experience of uncontrollability than did anxious individuals (feeling uncertain helplessness). He suggested that perhaps the anxious individuals continued to be watchful and attempted to cope with stressful experiences whereas the depressed person essentially gave up. This idea of perceived control as the cognitive component involved with both anxiety and depression has begun to generate additional research (e.g., Barlow, 2002; Chorpita & Barlow, 1998; Chorpita, 2001; Weisz, 1990; Weisz, Southam-Gerow & McCarthy, 2001).

With respect to the model, structural analysis has produced convincing evidence that a general higher order factor is related to anxiety and mood disorders. It was also able to further define the unique relationships among these disorders. With adult samples (e.g., Brown, Chorpita & Barlow, 1998; Zinbarg & Barlow, 1996) and child samples (e.g., Spence, 1997; Spence, Rapee, McDonald & Ingram, 2001) a higher order factor similar to GAD and neuroticism (i.e., NA) was common while lower order factors (e.g., behavioural inhibition, social isolation) discriminated among other anxiety disorders (e.g., social anxiety, generalised dysphoria, obsessions and compulsions, simple fears, agoraphobia and fear of fear). Of interest to the present study because of its relationship to early temperament is the finding by Brown et al. (2001) that social phobia tends to predate GAD though the two are also often comorbid. If this were the case, behavioural inhibition and social isolation seen in some children at an early age would be important to be aware of as possible risks for disorder development.

#### **3.2.3.4. Hierarchical Integrated Model**

In order to more accurately reflect research to date, Mineka et al. (1998) proposed the integration of key elements of Clark and Watson's (1991) tripartite model with Barlow's (1991; Zinbarg & Barlow, 1996) hierarchical model of distress disorders. They proposed a hierarchical model with each disorder having NA in common, but in varying amounts, as well as a

component unique to the disorder. So, the higher order NA factor would be common to anxiety and mood disorders, the PA factor would be uniquely related to depression while PH would have a more limited role as a differentiating factor for panic disorder (see Brown et al., 1997) rather than as a lower order factor to differentiate all anxiety disorders from depression. As such, Chorpita (2002) has agreed with Lonigan and Phillips (2001) that PH may be better represented as a more transitory construct than the temperamentally stable constructs of NA and PA. In fact, recent investigations have found PH measures to be correlated strongly with depression scales in both adult and child samples (Brown, et al, 1998; Chorpita, 2001; Chorpita & Daleiden, 2002; Chorpita, Plummer & Moffitt, 2000; Joiner et al, 1999, 2000). Chorpita's (2002) large scale assessment of school children looking at the structural relationships among the tripartite factors and dimensions which represented some anxiety disorders and depression supported the revised model. Additionally, it found differing age effects in terms of the NA and PH dimensions. Specifically, Chorpita and Daleiden (2002) found that PH correlated most highly with a panic measure and correlated more highly with depression than it did with worry in a child and adolescent clinical sample. This corroborates observations of earlier researchers that somatic symptoms tend to accompany depression in children (Kashani & Carlson, 1987; Kashani, Rosenberg & Reid, 1989).

General empirical evidence has accumulated in support of NA and PA being possible temperamental risk factors for the development of anxiety and mood disorders (Chorpita & Daleiden, 2002; Clarke, Watson & Mineka, 1994; Lonigan & Phillips, 2001; Stark & Laurent, 2001) with PH more specifically related to panic than the other anxiety disorders (Brown et al. 1998; Mineka et al, 1998). New Zealand research has replicated these findings (e.g., Krueger, Caspi, Moffitt, Silva, & McGee, 1996). These findings support the view of Mineka et al. (1998), that research and thinking must direct attention to "more complex multilevel hierarchical models in which groups of symptoms are classified at varying levels of specificity"

(p.398). By contemplating this view, perhaps investigators will be open to considering multiple risk factors for distress disorders and be more willing to consider early intervention in order to prevent the development of subsequent mood and mixed disorders.

In summary, it seems that evidence from several different areas points to negative affect/neuroticism as being a risk factor for development of later distress. The current study's proposed model is designed to assess how that risk develops into distress. However, finding out how anxiety and depression are different may be useful for determining clinical severity and facilitate later intervention.

### **3.3. Differentiating between Anxiety and Depression**

Two possible methods of differentiating between anxiety and depression may be through self-report measures and cognitive features. These two differentiation methods are now discussed.

#### **3.3.1. Self-report Measures**

Self-report measures have posed a problem of differentiation. Early attempts (Dobson, 1985) found substantial correlation (.61) and shared variance (from .37 to .47) among a number of adult anxiety and depression scales. Studies since have found that depression and anxiety measures in current use (e.g., Revised Manifest Anxiety Scale for Children, RCMAS; State-Trait Anxiety Inventory for Children, STAIC; Child Depression Inventory, CDI) are able to discriminate depressed or anxious children from nondepressed or nonanxious children but have not been able to consistently discriminate between the different syndromes. Self-report measures of anxiety and depression typically correlate between .5 and .7 (e.g., Brady & Kendall, 1992; Hodges, 1990; Stark & Laurent, 2001).

Factor analysis studies of various child anxiety and depression measures have reported a number of factors with unique as well as mixed loadings of depression or anxiety items (Boyd & Gullone, 1997; Ollendick, Yule & Ollier, 1991). Stark and Laurent (2001) used empirical means (principal axis factoring with oblique rotation) to identify items from the RCMAS (Reynolds & Richmond, 1985) and the CDI (Kovacs, 1992) which uniquely measured anxiety and depression within a school sample (750 nine to twelve year olds). They found a nine-item depression factor composed mostly of negative self-appraisal items and a seven-item anxiety factor comprising worry items both of which only loaded moderately on the higher order factor (i.e., NA). They were not able to find factors that represented PH with none of the items from the RCMAS PH subscale loading as a unique factor.

Citing overall problems with current measures, they also suggested that clinical utility would be served if new, more differentiating measures were designed. Others have tried to design measures which would be more sensitive to negative emotions and arousal for use in longitudinal risk and protection research (PANAS-C; Laurent et al., 1999; Affect and Arousal Scales, AFARS; Chorpita, Yim, Moffitt, Umemoto & Francis, 2000). These measures are less functional for clinical use but can confirm and differentiate between NA and PA. Chorpita (2002) points out that understanding the relationship between self-report dimensions of anxiety disorders and actual diagnoses is in its infancy (Beidel, Turner & Fink, 1996; Chorpita et al., 1997). However, preliminary data from clinical samples does show some promise (Moffitt, Gray & Chorpita, 2000, cited in Chorpita, 2002). Perhaps a more useful differentiation would be an examination of the cognitive features proposed for each.

### **3.3.2. Cognitive Features**

Inherent within any human emotional construct are cognitive features. In the past decade, substantial progress has been made in understanding what

cognitive components are involved in the development and maintenance of anxiety and depression and in how they relate to each other (Alfano, Beidel & Turner, 2002). Cognitive processes may be useful in understanding the progression of thoughts associated with disorder development.

The expansion of Beck's cognitive model of depression to encompass psychopathology in general (Beck & Emery, 1985) helped to focus attention on the cognitive aspects of other disorders. This model proposes that differences in cognitive content are central to psychopathology in general and to anxiety and depression specifically (Beck & Emery, 1985; Beck, 1993; Beck & Clark, 1997, Young & Behary, 1998). Beck proposed that cognitive schemata formed in early childhood about the self, world and future (labelled the cognitive triangle), remained unconscious and automatic parts of the individual's thinking and behaviour throughout life (Young & Behary, 1998). He suggested that anxious individuals automatically oriented themselves to anticipate future threat or harm. This was done cognitively by means of schemata centred on themes of uncertainty and danger. On the other hand, depressed individuals had negative automatic thoughts about themselves, the world and the future based on schemata organised around themes of hopelessness, worthlessness, personal deficiency, failure and loss.

Research has generally supported this model of cognitive content specificity and its compatibility initially with the two factor model (D.A. Clark et al., 1990) and later with the tripartite model (L.A. Clark et al., 1994; Steer et al., 1995) in adults. However, the picture may be different for children. In a recent review, Alfano, Beidel and Turner (2002) reported that anxiety disorders and depression in youth have not been able to be readily differentiated by cognitive content. For example, Ambrose and Rholes (1993) studied threat and loss as predictors of anxiety and depression scores in a community sample of 5-, 8- and 11-year-old children. They found that threat and loss cognitions were related to both anxiety and depression in this sample. What differentiated between anxiety and

depression here was the frequency rather than the content of the cognitions. A greater frequency of both threat and loss cognitions were reported by those children with higher depression versus anxiety scores. This suggests that perhaps anxious children are, in keeping with research reviewed in Chapter 2, less distressed than their depressed counterparts. Kaslow, Stark, Printz, Livingston and Tsai (1992) used a cognitive triad inventory for children with a community sample of anxious, depressed and comorbid anxious/depressed children (aged 9-12 years). These youth were identified through multiple-gate screening and diagnosed using a clinical measure. They found that the three disordered groups had a significantly less positive view of self, other and the future compared to controls. The anxious disordered group was significantly differentiated from the two depressed groups in the frequency of the negativity. Still, the comorbid group reported the greatest frequency of negative thoughts. Like Ambrose and Rholes (1993), these researchers too suggested that anxiety may be differentiated from depression on a continuum of negative thought content frequency, at least in children.

Moving from thought content, recent interest has focused on the unconscious cognitive processing of anxious and depressed children in an effort to determine how these cognitive schemata arise and perhaps differentiate conditions (see Vasey & MacLeod, 2001 for review). Compatible with Beck's view, Kendall et al. (1992) suggest that anxious and depressed children tend to process information in a distorted manner rather than being deficient in their ability to process information. In line with this view, Vasey, Daleiden, Williams and Brown (1995) were the first to find that, like anxious adults, anxious youth (aged 9-14 years old) had attention biases. That is, they attended to and made judgements about potential threat more than nonanxious youth. Others have found that anxious children made fewer positive estimates of future events than nonanxious children, especially in their area of concern (e.g., social events for socially fearful children; Spence, Donovan & Brechman-Toussaint, 1999) and were

more likely than their nonanxious counterparts to use avoidant coping (e.g., Barrett, Rapee, Dadds & Ryan, 1996; Bell-Dolan, 1995). This biased processing of emotion-related information (e.g., both interpreting ambiguous situations as threatening and not feeling that they will be able to cope with that situation, so avoiding it as much as possible) can escalate the child's distress and generally influence their perceptions about themselves and their world (e.g., Spence et al., 1999). Such a processing style can foster a cognitive schema based around a pervasive sense of threat and uncertainty (Ronan & Deane, 1998; see also Beck in this chapter). Other studies have found children and adolescents with varying anxiety disorders (after controlling for comorbid depression) tended to have cognitive processing styles characterised by overgeneralizing, catastrophizing and personalising. Younger anxiety disordered children (7- 11) showed a similar overgeneralizing tendency to older children, but tended to be less likely to personalise or catastrophise (Weems, Berman, Silverman & Saavedra, 2001). In contrast, depressed individuals do not appear to have particular attention biases in the present (Mogg, Bradley, Williams & Mathews, 1993; Neshat-Doost, Moradi, Taghavi, Yule & Dalgleish, 1997) but are more likely to have memory biases (i.e., remembering negative information most particularly referring to themselves, Mogg et al., 1993, Mogg, Bradley & Williams, 1995) than are nondepressed or anxious individuals (Bradley et al., 1995; Mathews, Mogg, Kentish & Eysenck, 1995; Nugent & Mineka, 1994; Neshat-Doost, Taghavi, Moradi, Yule & Dalgleish, 1998). This bias, in adults, has predicted greater levels of depression three to seven years later (Brittlebank et al., 1993; Dent & Teasdale, 1988), however no longitudinal studies of children were found. Taken together, it seems that research is beginning to confirm Tellegen's (1985) contention that anxiety is an engaged state with a present and future focus while depression is disengaged and past focused.

To summarise the proposed distinction between the thinking processes of anxious and depressed individuals, it appears that while anxiety and

depression have related features, they also have some distinct ones. That is, despite the general negative feelings displayed and their shared belief that negative events will occur, they do come to this conclusion differently. Evidence suggests that anxious individuals tend to anticipate current and future disaster and prepare themselves for this disaster by attending to possible emotionally-relevant cues even where situations are ambiguous (Vasey & Dadds, 2001; Vasey & MacLeod, 2001). A further problem for these individuals is that they are not naturally able to focus away from the negative event at the time, leaving avoidance as the only viable strategy for reducing stress (Lonigan & Phillips, 2001). On the other hand, depressed individuals tend to think about past memories and maintain their belief that disaster will continue to befall them by remembering their past failures, thus unconsciously maintaining and even exacerbating distress (Neshat-Doost, et al., 1997, 1998). Underlying both of these styles appears to be an idea central to Barlow's model of anxiety and depression development, a lack of perceived control with anxious children still possibly having hope that they may be able to control life and depressed children perhaps having lost that hope (e.g., Barlow, 1991). Owing to its central role in the model tested in the current study, this construct is explored more fully in Chapter 10.

### **3.4. Chapter Summary**

Although this chapter has not offered an exhaustive review of the relationship between anxiety and depression, it has investigated the various themes which connect anxiety with depression genetically, sequentially, structurally and cognitively. Evidence presented argues for putting anxiety on a continuum with depression. Attempts to differentiate between the two disorder clusters have been of limited success because of comorbidity and the large Negative Affect component shared by both. Additionally, it may be that a unitary model is more applicable for younger children (Cole et al., 1997) with increasing differentiation perhaps with development. Further, measures of anxiety and depression in children have not been able to adequately discriminate between the two symptom clusters (e.g., Chorpita,

2002; Stark & Laurent, 2001), compounding the differentiation problem. More recently, the cognitive features of these disorders have been put forward as a possible means of differentiation (Alfano et al., 2001; Mineka et al., 1998). However, even here, discriminatory difficulties are apparent, particularly for younger children. Considering this evidence and the present sample of 8- 11 year olds, it has been decided that anxiety and depression will be reviewed together. Where literature applies specifically to each, it will be labelled, but otherwise, the combination will be referred to as "distress", a term borrowed from L.A. Clark et al. (1994) to encompass both clusters of disorders.

The following chapters explore constructs which are incorporated into a proposed model of distress disorder development. However, to set the stage for those constructs, the next chapter will examine a rationale and means for studying risk and protective factors in relationship to distress disorder development.

## **CHAPTER 4.**

### **THE STUDY OF RISK AND PROTECTION FOR DISTRESS DISORDER DEVELOPMENT**

#### **1.5. Chapter Overview**

This chapter is focused on the introduction of the study of risk and protection within the paradigm of developmental psychopathology, the frame within which the study of distress is placed. First, the rationale for studying risk in relation to distress disorders and particularly what constitutes risk when a child is anxious is examined. Next, an explanation of a risk and protection framework for studying distress is provided. This includes specific definitions of the terms and how they are best measured.

#### **1.6. Rationale for the Study of Risk and Protection with Distressed Children**

Previous chapters have considered the idea that anxiety disorders in children and adolescents deserve important consideration as, once they get established in adolescence, healthy later adjustment free of distress, is less certain (e.g., Chorpita & Barlow, 1998). For example, a number of adult anxiety disorders have been reported to have their onset in anxiety in childhood or adolescence (Barlow, 2002; Brown et al., 2001; Burke, Burke, Regier & Rae, 1990; Kendler, Neale, Kessler, Heath & Eaves, 1992). Most importantly, however, anxiety disorders impair adaptive functioning in the present as well as lay the foundation for future problems in a wide range of areas, both anxiety and otherwise (Horwood & Fergusson, 1998; McGee & Stanton, 1990; Ronan & Deane, 1998; Weiss & Last, 2001).

### **1.7. Profile of an Anxious Child: What Constitutes Risk**

Functionally, how do anxiety-prone children act? They are likely to have a natural tendency to be shy, emotionally reactive and/or be upset by and avoid new experiences (e.g., Buss & Plomin, 1984; Kagan, 1997; Lonigan & Phillips, 2001). By middle childhood, often these children are consistently avoiding situations they perceive will be stressful (e.g., Rubin & Burgess, 2001; Thompson, 2001) and may even use elaborate avoidance measures (e.g., stomach or head aches, nausea; Kendall, 1992). Continued avoidant behaviour subsequently results in not learning the necessary skills to cope when a stressful situation inevitably appears (Thompson, 2001). So, even when the child is brave enough to try an approach strategy in a particular situation, they are less likely to succeed because of lack of practice (e.g., Vasey & Dadds, 2001). Rubin and Mills (1991) suggest that by middle childhood their avoidance and reluctance has begun to be noticed by peers. They are also likely to express a negative opinion of their general abilities and their specific ability to manage their anxious feelings (Ronan & Deane, 1998).

There are a number of factors which make it more likely (risk factors) or less likely (protective factors) that anxiety will seriously affect daily and long-term functioning. Various theorists suggest that anxious children generally possess a biological vulnerability to stress as they tend to have been emotionally reactive infants (Davidson, 2000) and behaviourally inhibited in relation to novelty as toddlers. By 7 or 8 years old, they are indeed more reluctant to engage in conversation with unfamiliar people compared to nonanxious youth (e.g., Kagan, 1997; Rubin & Burgess, 2001). These children are the ones whom disaster researchers found to have the most intense and sustained reaction to stressors including natural and other disasters (La Greca, Silverman & Wasserstein, 1998). These children also tend to have their attention more exclusively focused on possible threat. Because of this processing bias, they may be less able to observe how

others cope and learn coping skills of their own (Kendall, 1992; Thompson, 1998). These distress-prone children are also affected by environmental stresses like illness or parental stress (e.g., Manassis & Bradley, 1994; Rubin & Burgess, 2001), parental rejection and/or psychological control (Barber, 2002) and general family conditions like enmeshment, conflict and social isolation (e.g., Stark, Humphrey, Crook & Lewis, 1990).

Attachment theorists suggest that a secure relationship with the primary caregiver has the ability to protect vulnerable children from being overwhelmed by their anxious feelings in times of stress (e.g., Thompson, 2001). A secure relationship allows a child to develop schemata that they are worthwhile and others are trustworthy to provide help when needed (e.g., Bowlby, 1988). Chorpita and Barlow (1998) suggest that this secure attachment relationship, which also encompasses sensitive, contingent parenting (Barber, 2002; George & Solomon, 1999), allows the child to gain a better sense of control. This gives them the courage to overcome their natural tendency to avoid which, in turn, makes it more likely that they will begin to feel competent. Increasing approach-related behaviour then reduces the chance of anxiety becoming a problem. These authors also suggest that the reverse is true, where the experience of a diminished sense of control from an insecure attachment and family adversity leads to problems.

### **1.8. Conceptual Framework for Assessing the Antecedents of Childhood Distress Disorders**

While there has been considerable research focused on anxiety disorders and their relationship to such factors, this research has tended to be targeted at individual constructs and be approached through "downward extensions of adult theories" (Vasey & Dadds, 2001, pp. 4) rather than on multiple inter-related factors transacting (ibid, 2001). However, more recently some childhood anxiety researchers (e.g., Chorpita & Barlow, 1998;

Manassis & Bradley, 1994; Stemmerger, Turner, Beidel & Calhoun, 1995; Vasey & Dadds, 2001) have emphasised multiple factors (Barrett, 2000).

Vasey and Dadds (2001) suggest that multiple factors and their relationships can be better understood within the study of developmental psychopathology, generally and within a risk factor model in particular. More specifically, the development of anxiety disorder may be seen as evolving from a series of both risk and protective factors impacting on how a child thinks and feels about their ability to cope with stress each time they encounter it. In line with this idea, the present thesis confines itself to the study of risk and protective factors for anxiety development, a sub-discipline of developmental psychopathology. For more on developmental psychopathology, the reader is directed to the work of other researchers (e.g., Cicchetti & Cohen, 1995; Cicchetti & Toth, 1997; Cicchetti, Rogosch & Toth, 1997; Vasey & Dadds, 2001)

### **1.9. Study of Risk and Protection for Distress**

Cicchetti (1990) has suggested that those interested in studying any kind of pathology in children would be "interested in understanding the effects of experiences on both current and future adaptation and in identifying those factors both within and beyond the individual that either promote or inhibit competence" (pp. 17). The study of risk and protection can facilitate this endeavour. A risk or vulnerability factor is defined as "a characteristic, experience or event that, if present, is associated with an increase in the probability of a particular outcome over the base rate of the outcome in the general population" (Kazdin, Kraemer, Kessler, Kupfer & Offord, 1997, p.377). Risk factors could include: parent psychopathology, an emotional temperament, insecure attachment relationship, family conflict that may negatively influence "biological, emotional, cognitive and interpersonal representational systems" (Cicchetti, Rogosch & Toth, 1997, pp.320) over the life course. Protective factors may act to encourage those

representational systems to facilitate competence and adaptation in the face of the risk. Protective factors have been defined as “antecedent conditions associated with a decrease in the likelihood of undesirable outcomes” in an otherwise high risk group (Kazdin et al., 1997, p.377). These include: a sensitive parent, secure attachment, family sociability and cohesion. For example, it is recognised that qualities of competence, perceived control or being securely attached differentially affect the child’s response to novelty in the moment as well as influence future adaptation (Kazdin et al., 1997). As such the presence of these protective factors can either cause the relationship between predictor and criterion variables to change (mediation; Holmbeck, 1997) or influence the intensity of the relationship (moderation; Holmbeck, 1997). The study of risk and protection also suggests that there are no exclusive paths to disorder development as many factors influence the numerous representative systems. Chorpita and Barlow (1998) contend that the protective factors mediate the relationship between environment and anxiety manifestation in early and middle childhood as beliefs (cognitive schemata) are forming. In later adolescence and adulthood, however, they are thought to be only able to moderate this relationship as schemata are more firmly established.

Protective or compensatory factors appear to play a pivotal role in promoting resilience in children who would be expected to have negative outcomes as a result of the accumulation of risk factors (Cicchetti & Toth, 1997). The study of resilience looks at identifying the factors which have consistently promoted healthy adjustment in those children who have survived physically and psychologically adverse environments (Haggerty, Sherrod, Garmezy & Rutter, 1994, Rutter, 1985). Rutter (1985) found that despite the fact that children reared under adverse conditions were at increased risk for psychological difficulties, many did not manifest these. Rutter concluded that there were three broad sets of variables that operated as protection against the risk of psychopathology. These were personality features such as self-esteem; family factors such as cohesion and an absence of conflict;

and extrafamilial factors such as the availability of external support that encouraged and reinforced a child's efforts at coping. Emmy Werner (1990) categorised these variables in a slightly different way. She suggested that dispositional attributes of the child such as an easy temperament, intelligence and physical energy that drew positive responses from others; affectional ties (e.g., a secure attachment relationship); and socialisation practices within the family which encouraged competence and provided children with a positive set of values, contributed in a cumulative way to resilience. Rutter (1987) concluded that children who survived adversity often had at least some of these conditions present in their lives. Additionally, they tended to have cognitive attributes of self-confidence and a sense of self-esteem; a belief in their ability to succeed and deal with change as well as a 'repertoire' of social problem-solving skills.

The study of risk and protection is not straight-forward. While biological and environmental risk and protective factors help to shape a child's perceptions of and reactions to the world, these perceptions and reactions influence their environment (Sameroff, 1995). These reciprocal transactions as well as the responses from others help to consolidate beliefs about the child's sense of control over and mastery of their world. Sameroff, Seifer and Zax (1982) contend that developmental outcomes can affect and can be reciprocally affected by any combination of relationships. For example, children can display atypical behaviours, which are not understood by primary caregivers. Alternatively, the caregiver can misconstrue the child's normative behaviour as a result of their own distorted perspective. Both of these can result in risk.

Cicchetti and Toth (1997) suggest that risk is cumulative, since children who are unable to complete developmental tasks at their appropriate time become more vulnerable to future maladaptation. For example, Williams, Anderson, McGee and Silva (1990) found that 40% of those youth in their New Zealand sample with eight or more risk factors while young, in contrast

with 7% with fewer than two risk factors, had significant behaviour problems at 11 years of age. In this study, risk factors included general instability factors (e.g., the number of school and residence changes); demographic risk factors (e.g., single parenthood, adolescent mother, low maternal cognitive ability and maternal mental health symptoms, low SES); and family risk factors (e.g., marital separation, family discord, seeking marriage guidance), all of which are factors that can be identified in most communities. However, risk also occurs more subtly. For example, temperamental factors like shyness and emotionality may contribute to anxiety aetiology through increased reactivity to stress (Gray & McNaughton, 1996) or through cognitive schemata that do not encourage bravery for the practice of social interactions (Rubin & Burgess, 2001).

Finally, apparent risk factors may, in fact, provide protection for some. For example, Cicchetti, Rogosch, Lynch and Holt (1993, cited in Cicchetti & Toth, 1997) found that, in a sample of school-aged children a number of maltreated children showed equal competence (i.e., moderate to high levels) to the nonmaltreated children. When ego control, ego resilience and self-esteem were measured within the competent group, only ego overcontrol (i.e., being reserved and constrained), generally considered to be a risk for anxiety, differentiated the competent maltreated from competent nonmaltreated children. This suggested that being reserved acted as a protective factor in adverse situations as it helped the child to be more vigilant to and prepared for possible threat of maltreatment (Werner, 1993). A further study confirmed that there seemed to be a cost in some cases to being apparently resilient. A secondary analysis done on resilient adolescents found that, although resilient children were viewed as being more competent than their peers (measured by self-report of participating in fewer deviant behaviours and teacher report of higher academic and behavioural competence), they still showed similarly low levels of perceived qualities (i.e., self-worth, competence, social support and negative affect) as

their stress-affected peers and had higher levels of anxiety and depressive symptoms than the low stress groups (D'Imperio, Dubow & Ippolito, 2000).

### **1.9.1. Acceptable Methods for Risk Factor Research**

Risk and resilience research in psychopathology embraces multiple bidirectional relationships at multiple levels of analysis. Kazdin, Kraemer, Kessler, Kupfer and Offord (1997) contend that risk-factor analysis, in its pure form, requires longitudinal research with a minimum of two time periods to determine the likelihood that a particular characteristic has influence over outcome in some way. However, Kazdin et al. (1997) suggest that cross-sectional correlational data assessed with methods like discriminant function analysis or structural equation modelling have a definite role to play in identifying or eliminating possible causal hypotheses in the interest of directing further research. D'Imperio, Dubow and Ippolito (2000) suggest two methods that have been standard in the study of risk. One uses discriminant groups based on central tendencies and variability within the group. This method is problematic as it reduces data to discrete variables so there is loss of information and arbitrary categories, both of which compromise generalisability. The other method uses continuous variables to examine the effect of certain protection and risk factors. Several researchers have used this latter method (e.g., DuBois, Felner, Brand, Adan & Evans, 1992; Dubow, Edwards & Ippolito, 1997; Garmezy, Masten, & Tellegen, 1984; Luthar, 1991). Although studies of economically high-risk populations are needed, most research has been done using clinical and general populations (Cicchetti & Toth, 1997).

## **1.10. Chapter Summary**

From a developmental psychopathology perspective, the study of the origins of childhood anxiety disorders requires a broad-based assessment of both inherent and contextual factors and their interaction (Thompson, 2001).

This not only requires the study of normative behaviour (e.g., how normal children regulate their emotions at different stages of development) but requires the researcher to view how anxious children cope with a world that they perceive as being full of uncertainty and impending danger. Studying the risks as well as what works to protect children from anxiety is important to understand more fully the aetiology of anxiety and ultimately understand what will help to manage these emotions. With a complex connection existing between anxiety and depression (e.g., genetic, sequential, structural, cognitive, empirical), understanding the risks for anxiety will ultimately help to make depression more understandable.

Before considering how risk and protective factors relate to each other in a model of anxiety and related disorders pertinent to middle childhood, it is important to understand the individual factors more fully and how they relate to each other individually. To this end, the following chapters will divide risk and protective factors into biological/temperamental risk and protection; environmental risk and protection; and cognitive risk and protection.

## **CHAPTER 5.**

### **BIOLOGICAL VULNERABILITY AS RISK FOR CHILDHOOD DISTRESS DISORDERS**

#### **5.1. Chapter Overview**

This chapter focuses on the first component of Barlow's model of anxiety aetiology and how early temperamental difficulties pose a risk for the development of anxiety and depression in children. To this end, first, there is a description of this component and how temperamentally-based anxious apprehension accumulates to increase risk. Prominent theories of temperament are discussed, with particular attention paid to Buss and Plomin's theory, Gray's neurobiological theory and the extensive research of Kagan in the area of Behavioural Inhibition. Accumulated research regarding the verity of this construct is discussed as well as how child temperament relates to parent temperament, family environment and later outcomes. These latter topics are developed further in later chapters.

#### **5.2. The General Biological Vulnerability Component of Barlow's Model of Anxiety and the Process of Anxious Apprehension**

Barlow's (1988, 2000, 2002) model of biological vulnerability to anxiety disorders incorporates Gray's neurological theory of anxiety development (1982; Gray & McNaughton, 1996). Barlow's model posits that for some individuals there is an innate tendency from infancy to react to the stress of negative life events with excessive neurobiological activity. Infants with this vulnerability have an apparent false or exaggerated alarm reaction including times when true threat is minimal or nonexistent. Barlow (1988, 2002)

further suggests that if no subsequent association between false alarm and interoceptive or exteroceptive cues are made, over-reactivity to stress would be more likely to diminish. Conversely, repeated associations with these false alarms would set the stage for the development of anxiety. The process of how vulnerability to distress progresses to anxiety starts at the idea of anxious apprehension.

*The Process of Anxious Apprehension:* Barlow suggests that repeated pairings of false alarm and danger cues result in prolonged levels of reactivity, causing fear conditioning. Further, continued hyperarousal leads to "anxious apprehension" as the individual anticipates but feels increasingly helpless to control future situations. When central nervous system tension and arousal become persistent, chronic anxiety can begin to develop (Gray & McNaughton, 1996; Chorpita & Barlow, 1998) and ultimately result in GAD, whose differentiating features include chronic worry (DSM IV; Brown, Barlow & Liebowitz, 1994). This tension may then be exacerbated by avoidance based on continuing apprehension about possible future danger (Barlow, 2002).

Barlow (2002) states that the process of anxious apprehension is not a description of the aetiology of anxiety but a model of how chronic levels of anxiety can develop when conditions of biological vulnerability meet the environmental conditions of uncontrollability and stress. What remains pertinent to children and to the present study are the consequences of the repeated experiences of anxious apprehension, subsequent avoidance and lack of practice and confidence in coping.

### **5.3. Evidence of a General Biological or Temperamental Vulnerability to Anxiety**

There is an abundance of research evidence from a number of quarters that suggests the potential of a biological vulnerability to the distress disorders.

In fact, even in the womb, fetuses differ in the intensity of activity and reactivity to sudden noise (i.e., startle response; Precht, 1997). This difference could continue beyond the womb as Kagan, Snidman and Arcus (1998) found higher heart rates in fetuses several weeks ante partum to be associated with higher levels of reactivity in 2 week-old and four month old infants both resting and under stress. Rothbart (1986) also observed individual differences in expressed distress and reflexive approach and withdrawal in infants at birth, with individual differences in positive affect observable by 2-3 months and cortically regulated approach and avoidance seen by 4-6 months.

A higher and less variable heart rate has been observed in temperamentally vulnerable children (Kagan, 1997) as well as right frontal lobe brain activity via EEG that is accompanied by fearful reactivity (e.g., Davidson & Fox, 1989; Davidson, Jackson & Kalin, 2000). Fox (1989) found individual differences in emotional reactivity and sociability in the first year of life to be associated with heart rate variability. Infants with high heart rate variability at 5 months showed greater emotional reactivity to positive (peek-a-boo) and negative (restraint of arms) stimuli, and at 14 months showed more approach and social behaviours in response to novelty. However, infants with low heart-rate variability showed less emotional reactivity at 5 months. At 14 months, they showed less sociability and greater caution in response to novelty. The latter group, even at this young age, appeared to learn to respond passively and to avoid the novelty at the expense of physiological arousal (i.e., high heart rate and low heart-rate variability). More recent neuroimaging techniques have shown that fearful infants as young as 4 months old had greater activation in the right prefrontal hemisphere of the brain (associated with emotionality) compared with their less fearful counterparts whose activity was differentially centred in the left hemisphere (Davidson, 2000; Davidson & Fox, 1989). These fearful infants also had higher levels of baseline cortisol. Both of these conditions have been related to aspects of trait-related reactions to stress and psychopathology in adults

(Kagan, 1997; Flinn & England, 1995; see also Gunnar, 2001). Right hemisphere activation and high cortisol levels have also been implicated in an individual's ability to modulate the intensity of negative affect after having been confronted with a stressful event (Davidson, 2000). This ability to modulate is referred to as Effortful Control (EC; Lonigan & Phillips, 2001).

#### **5.4. Continuity of Anxious Temperamental Disposition**

Rothbart, Ahadi and Hershey (1994) found that moderate continuity existed between various temperament variables measured in the newborn or in early childhood and those measured in early and middle childhood (Rothbart, et al., 1994). Using over 800 children from the Dunedin, New Zealand cohort, Caspi, Henry, McGee, Moffitt and Silva (1995) longitudinally examined three temperamental dimensions derived from behavioural ratings when children were three and five years old. The three dimensions: Lack of control (e.g., impulsivity, sensitivity to challenge, lack of persistence); Approach (e.g., exploration willingness) and Sluggishness (e.g., withdrawal from novelty, shyness, fear) were then compared with parent and teacher reports when children were 9, 11, 13 and 15 years of age. Findings indicated an association between all three temperament variables at 5 years and anxiety at 9, 11, 13, and 15 years. Later anxiety in boys was more related to Lack of Control and inhibited Approach; in girls, a Lack of Control and Sluggishness (Caspi et al., 1995). With the Lack of Control factor being similar to Rothbart's Effortful Control (EC) factor, evidence is mounting for the role of control and emotional regulation in the development of distress disorders in children (Lonigan & Phillips, 2001). It is possible that EC and emotional regulation are related to perceived emotional control (Thurber & Sigman, 1998) which has also been associated with anxiety (in 12 year old homesick boys). This topic will be discussed more fully in Chapter 10.

Temperamental characteristics displayed continuity as this cohort grew to adulthood. Caspi (2000) found that the inhibited children at 18 years old

reported being cautious rather than impulsive, enjoyed activities that were safe, did not like aggression or taking advantage of others and did not tend to be assertive. They also preferred to avoid leadership roles, acted submissively, and had little desire to influence others. At 21 years, when someone who knew them well described them, these young adults who were inhibited as children were rated as low on affection, confidence, outgoingness, popularity, health and creativity. Also at 21, the individuals themselves indicated that they lacked social support, which included less material support or mentorship and fewer companions compared to their less inhibited counterparts. While these inhibited children were significantly affected by internalising problems during adolescence (15 yrs.), they did not tend to meet diagnostic criteria for anxiety disorders at age 21. However, they did more often meet the criteria for major depression (Caspi, Moffitt, Newman & Silva, 1996). The finding indicating they were not at later risk for anxiety disorders is inconsistent with the studies of Biederman et al. (1990) and Hirschfeld et al. (1992). These studies found that inhibited children, who were themselves the off-spring of parents with panic and agoraphobia, had increased risk for multiple anxiety and phobic disorders. Caspi (2000) suggested that the discrepancy between the results of the two studies could be attributed to the short-term nature, smaller sample and more extreme dysfunctionality in participants associated with the Biederman et al. (1990) study. Gest (1997) assessed the long term effects of the specific construct of reaction to novelty from middle childhood to early adulthood and found slightly different results yet. He found that highly inhibited children were not significantly more distressed or less accepted by their familiar classmates. However in early adulthood, the inhibited participants, especially the men, reported a less socially active life than the less inhibited adults and were less positive and more distressed.

Another study found temperamental continuity to extend from middle childhood to middle age. An earlier cohort of males (born in 1928-29), who displayed behaviours of acute uncomfortability (i.e., panic in social

situations) and emotional inhibition (i.e., feelings of strain and awkwardness in others) between 8 and 10 years old, were studied at age 30 and again at age 40 (Caspi, Elder & Herbener, 1990). When assessed at 30 and 40 years of age, these men were described as being less assertive or insightful, more worried by demands, showed reluctance to act and showed withdrawal when frustrated. They were later than controls to marry, become fathers or establish stable careers. All of these outcomes suggest that they repeated the pattern of reluctance to enter unfamiliar social situations that they first displayed as children. Both of these studies confirm longitudinally, from different times in history, that a temperamental disposition to be worried and reluctant tends to continue from childhood. However, it does not necessarily become an anxiety or depressive disorder. The absence of disorder points to the possibility, asserted by Barlow's theory and the subject of the present study, that other conditions may have to exist for an anxious temperament to develop into pathology.

In summary, it appears that there is evidence from various areas of study to confirm the existence of a general biological vulnerability or risk that predisposes individuals differentially to anxiety and depression. There is further evidence to suggest that this vulnerability generally continues throughout life. Several theories have described the components of this vulnerability. The following sections further explain the nature of temperament and, more specifically, how constitutional vulnerability, anxiety and depression are thought to be linked.

### **5.5. Theories of Temperament related to Anxiety Vulnerability**

Unlike the prescriptive body-type concept of temperament used by the early Greek and Greco-Roman physicians (Diamond, 1974, cited in Goldsmith et al., 1987), early temperament is now seen as encompassing traits such as irritability, activity level, sociability and fearfulness (Goldsmith et al., 1987). Allport (1937) defined temperament as a combination of the individual's

characteristic behaviours that are seen to be dependent on that individual's constitutional make-up. This involves the individual's tendency to be emotionally stimulated including the general speed and strength of reaction; their general mood state, including fluctuations and intensity. It is generally agreed that dimensions of temperament reflect tendencies rather than stable, discrete behavioural characteristics and that these tendencies have biological underpinnings and tend to have more continuity than other areas of behaviour (Goldsmith et al., 1987). Psychological theories of temperament differ in their emphases, but emotionality appears to be consistently included as a fundamental feature. Studies are also emerging which relate temperament to particular forms of psychopathology, including anxiety and depressive disorders. It is felt that temperament "holds much promise for understanding the development of psychopathology" (Lonigan & Phillips, 2001, pp.60).

Findings from genetic studies to date have converged to conclude that with few exceptions (e.g., needle and blood phobias, Plomin, 1994) anxiety disorders appear to develop indirectly from an inherited genetic vulnerability (Kendler et al., 1995). What this vulnerability is comprised of has been debated and refined over the years. More than thirty years ago, Eysenck (1967) suggested that an 'overly responsive' autonomic nervous system was responsible for the biological vulnerability when the right combination of environmental and psychological circumstances prevailed. Early evidence of heritability of specific autonomic nervous system traits was found in twin studies (Hume, 1973; Lader & Wing, 1964, both cited in Barlow, 2002) with heritability likely for pulse rate and habituation and the number of fluctuations of galvanic skin response (GSR). McGuffin and Reich (1984) also suggested there may be a personality trait of 'emotionality' reflected in these psychophysiological behaviours that may be central to the development of anxiety disorders. Analysed data from large twin studies have pointed to this same conclusion (e.g., Kendler, 1996; Andrews, Stewart, Morris-Yates Holt & Henderson, 1990). However, Plomin (1994;

see also Robinson, Kagan, Reznick & Corley, 1992) asserted that, even in twin studies, genetics accounted for no more than half of the variance, which leaves another 50% to be accounted for by method error and environment.

There are four schools of temperament theory referred to by a number of researchers (Buss and Plomin, Goldsmith and Campos, Thomas and Chess and Rothbart). In the past few years terms and concepts of all four have crept into the literature. Additionally, Behavioural Inhibition (BI; see Kagan, 1997, 1998 for review) has been extensively researched and has been related to anxiety at different ages. In addition, Gray's (1982) neurobiological theory has been linked to BI, including neuroimaging correlates of negative affect (e.g., Davidson, 2000). These various models underpin Barlow's biological vulnerability construct. Consequently, the sections that follow briefly review the theories of Rothbart, Buss and Plomin, Kagan, and, to a lesser extent, Gray<sup>2</sup>. Those interested in exploring the other theories are directed to a review article by Goldsmith et al. (1987).

### **5.5.1. Rothbart's Theory of Reactivity**

Rothbart defined temperament as relatively stable, primarily biologically based individual differences in reactivity (i.e., arousability of behavioural, autonomic and central nervous and endocrine systems responses) and self-regulation (i.e., variability in attention, approach, avoidance, self-soothing and inhibition; Rothbart, 1989). At a higher order level, she described temperament as encompassing individual variability in positive and negative reactivity, inhibition to novelty or intensity of stimulation as well as effortful control (EC; a later developing brain system stable by 24 months and identified as the ability to self-soothe or reduce reactivity; Rothbart, Posner & Hershey, 1995). She also expanded the theory to include the

---

<sup>2</sup> Although Appendix B presents Gray's theory in more detail, it was not included here owing to space limitations and the fact that the brain systems of Gray's theory were not assessed here.

predisposition to particular reactions, such as laughter or fearfulness and ability to use and regulate emotions. For her, personality included constructs like self-concept, cognition and attitudes as well as perceptual and response strategies that developed with maturity and experience, while temperament remained the biological basis for the development of personality.

### **5.5.2. Buss and Plomin's EAS Theory of Temperament**

Buss and Plomin (1984), whose child and adult temperament measures were used in the present study, originally defined temperament as three inherited, stable and enduring personality dimensions that appeared during the first year of life: a) emotionality: equivalent to distress and varying from almost complete lack of emotional response to an 'out-of-control' emotional reaction; b) activity: involves arousal varying from lethargy to extreme energy and includes the components of tempo and vigour; c) sociability: is the individual's preference to be with others as opposed to being alone (Buss & Plomin, 1984). Buss and Plomin (1984) suggest that the three dimensions display factorial unity, though they have sufficient discriminant validity to be distinct from each other. After discovering that their particular sociability dimension organised more precisely around shyness or fearfulness in unfamiliar social situations (which they found was generally not so for unsociable individuals; Cheek & Buss, 1981), they revised their model to include a 'shyness' as well as sociability scale (Buss & Plomin, 1984). They further suggested that high shyness and high emotionality in young children appeared to relate to Kagan's notion of 'Behavioural Inhibition' (Kagan, 1989) and Gray's (1982) biological description of 'behaviour inhibition'. For this reason, emotionality and shyness are the indicators of Child Temperamental Vulnerability used in the present study's proposed model of aetiology.

Using a sample of 222 Dutch children between the ages of 4 and 13, Boer and Westenberg (1994) found the three original factors of emotionality, activity and shyness (formerly sociability) to load separately and independently on individual factors similarly to original research (Rowe & Plomin, 1977) with average intercorrelations of .16 across gender and age groups. The measure's predictive validity was demonstrated with these early childhood factors predicting later mother report of high anxiety/depression on the CBCL (Child Behaviour Checklist) at age seven (Rende, 1993). Buss and Plomin (1984) suggested that for children, emotionality was more likely to be displayed as general distress and autonomic arousal and, in adults, differentiated into the separate components of more specific emotions. Factor analysis of the adult measure yielded distress, fearfulness and anger as lower order components of emotionality with distress representing "primary" emotionality (Buss & Plomin, 1984). Using a more rigorous methodology and a sample of 290 adolescents, Anthony, Lonigan, Hooe and Phillips (2002) found two orthogonal higher order factors. They were: Negative Temperament (NT) with distress, fear and anger as lower order factors; and Positive Temperament (PT) with sociability and activity as lower order factors. Both the NT and PT constructs demonstrated both discriminant and convergent relationships with Negative Affect (NA) and Positive Affect (PA) consistent with the tripartite model: NT associated with both anxiety and depression scores and PT associated to depression scores alone. This study suggests the versatility of the measure as a self-report measure to use with children and adolescents.

In their review of recent research on temperament, Rothbart and Bates (1998) found that most parent-report, early childhood scales measured basic, relatively consistent, biologically-determined dispositions that underlie and enhance or inhibit the expression of emotionality, sociability, activity and reactivity (see also Goldsmith et al., 1987; Prior, 1992) and generally involve motivational aspects of behaviour (Lonigan & Phillips, 2001).

Behavioural genetics studies have found these to be some of the most heritable traits of personality (Buss & Plomin, 1984; Plomin, Pedersen, McClearn, Nesselroade & Bergeman, 1988). These temperamental traits appear to interact with the environment to become a complex organisation of systematically interrelated trait dispositions, which are consistently labelled as personality (Clark, Watson & Mineka, 1994).

### **5.5.3. Kagan's construct of Behavioural Inhibition**

As a temperament concept, this theory is distinct from the other temperament theories as it describes one discrete multifaceted characteristic of children rather than a continuous variable included in a range of behaviours (see Kagan, 1994, 1997, 1998; Turner, Beidel & Wolff, 1996 for reviews). It also was the first sophisticated, scientific series of studies that showed specific evidence of a biological correlation with temperament. Jerome Kagan and colleagues identified two temperamental qualities that appeared to relate to anxiety in children as high physiological reactivity to novelty and fearful, wary and timid behaviour when novelty was a salient feature. Kagan, Reznick, Clarke, Snidman and Garcia-Coll, (1984) defined this temperament pattern as 'uncertainty to the unfamiliar' (p. 2211) and labelled it Behavioural Inhibition (BI). Behavioural manifestation of BI included variables like, proximity to the parent, verbal displays of distress and cessation of activity as well as the reluctance to offer unsolicited speech in the presence of peers and adults. Further research found that 40% of one year olds and 15-20% of two year olds reacted to novelty or strangers in a similar way (Kagan, 1989; Kagan & Snidman 1991, 1999; Kagan, Snidman & Arcus 1998). These behaviours appeared to remain stable in 50% to 66% of the inhibited children until at least 8 years of age (Kagan & Snidman, 1991). Physiological measures have also been taken. By comparing the heart rates of 4-year-old children classified as 'inhibited' and 'uninhibited' as they performed simple tasks, they found that the inhibited children had significantly higher and less variable heart rates than the uninhibited

children (Kagan, Reznick, Snidman, Gibbons & Johnson, 1988). Further, these children at the age of 5.5 years had significantly higher heart rates and less variability, pupil dilation, cortisol levels, norepinephrine activity and levels of voice pitch under cognitive stress, compared to the uninhibited children (Kagan, 1994).

As mentioned in Section 5.3, Kagan (1997) linked heart rate invariability and high cortisol levels in inhibited children and findings concerning brain activity of emotionally reactive infants (Davidson & Fox, 1989) with adult findings where similar conditions were linked to a chronic vulnerability to adult anxiety and depression (Davidson, 2000). These links as well as similar findings concerning similar EEG patterns and chronically high cortisol with fearful monkeys under constant stress (e.g., Kalin, Shelton & Davidson, 2000) have provided great potential for understanding biological vulnerability as a possible risk factor for anxiety disorder development.

Other research concurred with the association between this temperament and the vulnerability to anxiety disorders. Biederman et al. (1990) found that children scoring high on BI at 21 months were six times more likely to develop multiple specific phobias at 7 or 8 years than uninhibited children (31.8% vs. 5.3%). Also, the average number of fears reported for the inhibited group was 3.4 per child with nearly half of the inhibited sample having five or more fears (a qualification for a phobic diagnosis). Biederman et al. (1993) and Hirschfeld et al., (1992) found that children with this temperament were at increased risk for developing a number of anxiety disorders in later childhood. Rosenbaum, Biederman, Hirschfeld, Bolduc and Chaloff (1991) found that first-degree relatives of inhibited children had a significantly elevated pattern of anxiety disorders compared with the relatives of uninhibited children. In their review, Turner, Beidel and Wolff (1996) suggested that there was enough evidence in the literature to date to consider BI as a risk factor for the development of later anxiety disorders in children.

As mentioned, Buss and Plomin (1984), while believing BI to have a heritable component, suggested this temperamental quality be more accurately named 'emotionality' as behaviours such as fear/shyness and distress at a novel situation are displayed. Lonigan and Phillips (2001) suggested that BI, despite its categorical classification, was very similar to neuroticism (N) with BI children having consistently high NA/N (e.g., EAS emotionality including shyness, inhibited approach and distress). Barlow (2002) too saw a connection between these constructs, suggesting that BI was similar to lower order factors of distress and shyness in Buss and Plomin's emotionality construct which were also represented as neuroticism (N) in the Five-Factor model of personality. He also saw these as being compatible with Gray's neurobiological theory of anxiety manifestation.

The physiological manifestations of BI appear to have continuity in their relationship to anxiety disorders. High resting heart rate and low variability of vagal responsiveness in relationship to environmental challenge found in BI children (Kagan & Snidman, 1999) and in reactive infants (Kagan & Snidman, 1991) has been found more recently in patients with GAD (Thayer, Friedman & Borkovec, 1996) and with OCD (Hoehn-Saric, McLeod & Hipsley, 1995). In fact, anxious patients in general display a higher resting heart rate and show more autonomic nervous system inflexibility relative to controls (Craske, 1999). This lower heart rate variability has been associated with the worry process (Thayer, Friedman & Borkovec, 1996). The accumulated evidence has led Thayer et al (1996) to agree with Kagan (1994) that this heart-function combination may be the genetic component of BI. They also suggest that as the fearfulness of behaviourally inhibited children is likely to result in their avoidance of stressful life events, anxiety disorders may be a result of genetic vulnerability combined with early 'lack of practice' at social skills that would protect them in difficult life circumstances. Barlow's theory adds that those with a vulnerable temperament who are nurtured (e.g., made to feel a sense of control by

being encouraged to conquer stressful situations in a secure attachment relationship with a sensitive parent) are less likely to develop anxiety because they are encouraged to overcome their natural tendency to withdraw.

Integral to Barlow's model of anxiety aetiology are the behavioural manifestations of different brain systems which have been associated with temperament. They include the Behavioural Inhibition System (BIS), Behavioural Activation System (BAS), Fight-Flight System (FFS) and Effortful Control System (EC). Derryberry and Rothbart (1997, cited in Lonigan & Phillips, 2001) have categorised the BIS/BAS and FFS as reactive and the EC system as effortful processes which regulate the BIS/BAS systems. Gray (1982; Gray and McNaughton, 1996) and Barlow (2002) describe the reactive processes as affective motivational systems. For more information on Gray's theory, see Appendix B.

## **5.6. Child Temperament, Parent Personal Vulnerability and Parenting Styles**

Plomin and Caspi (1999) assert that temperament affects how an individual chooses, modifies and perceives their environment. Barlow (2002; see also Bowlby, 1973 and Chapter 7) has added another step to this, suggesting that temperament affects the development of cognitive schemata which guide the child and adult in how they value themselves and how they trust others to support them. These schemata in turn affect how the individual chooses, modifies and perceives their environment. Twin and sibling studies have estimated heritability accounted for about a third (i.e., 34%) of variance of emotionality (comprised of fear anger and distress); 20% of sociability and 25% of neuroticism (i.e., NA) (Plomin & Caspi, 1999). Although not found to be directly heritable (Plomin, 1994), it appears that parental anxiety also has considerable influence. A large Australian family study (McClure, Brennan, Hammen & LeBroque, 2001) recently found that

maternal anxiety disorder more than doubled the risk of anxiety disorders in both male and female offspring (15 years old). The presence of comorbid anxiety and depression in the mothers tripled the risk for offspring. The father's disorder status did not seem to affect risk in some studies (e.g., Plomin & Caspi, 1999), but did in others (Ge, Conger, Lorenz, Shanahan & Elder, 1995). Although these findings indicate the presence of genetic influence, there still seems to be evidence implicating environmental proximity as well.

Theory and research have consistently pointed to the influence of parental temperament on their child's behaviour though it is difficult to disentangle parent temperament from parenting style (Rubin & Burgess, 2001). Rubin and Mills (1988) suggest that parents' reactions to their child are determined by their own state of mind (e.g., their own feeling of attachment security and temperamental disposition) interacting with their perceptions of the child's capabilities at the time (also see Section 8.12.). An observational study with a sample of latency-aged anxious children suggests evidence of the transmission of emotional states from parents to children. The mother's level of distress was a major determinant of whether the children chose an avoidant solution to a problem after consultation with their parents (Shortt, Barrett, Dadds & Fox, 2001). Similarly, Steele, Tripp, Kotchick, Summers and Forehand (1997) found that in families where the father was chronically ill, the severity of the child's anxiety could be predicted by the extent of the uncertainty experienced by the mother concerning her partner's condition, over and above the child's own uncertainty.

Trauma and experimental research has also supported the direct transmission of fear and anxiety from parents to children. This research suggests that there may be social learning—particularly modelling involved, even from infancy. For example, Perry, Potland, Blakely, Beker and Vigilante, (1995) found that parental fearfulness was associated with increased stress, arousal and hypervigilance in infants. Very early studies

(reviewed by Rachman, 1991) reported children's fears during air raids in World War II were directly related to their mothers' expression of fear. Also with much younger children, Klinnert, Campos, Sorce, Emde and Svedja (1983) found that if mothers acted afraid when their one year old children were asked to perform a physical challenge, the children showed distress and did not perform the task. However, when the mothers showed interest and enthusiasm, most of the children performed the task. One study on the effect of parental fearfulness on older children's fears (aged 10-12; Muris, Steerneman, Merckelbach & Meesters, 1996) found a positive association between trait anxiety in a small sample of clinically-referred children and trait anxiety in both their parents. Additionally, it was found that there was a direct linear relationship between child scores on the fear schedule (FSSC) and mothers' self-ratings of both fearfulness and her verbal expression of her fears to her children. That is, mothers who expressed their fears frequently had children who had high fearfulness scores while mothers who were less likely to express their fears had children with low fearfulness scores. The attachment literature also has described the fearful responses of mothers being transmitted to their infants (e.g., Lyon-Ruth & Jacobvitz, 1999; Perry, Potland, Blakely, Beker & Vigilante, 1995).

Other areas besides fearfulness and anxiety appear also to be enhanced by observational learning in families. Daniels and Plomin (1985) found that shy children had mothers (both adoptive and biological) who were low on a parental sociability scale. Evidence from personality questionnaires suggested that parents of two year old children assessed by observers as inhibited tended to be significantly less extroverted and more avoidant, shy and anxious than the parents of uninhibited children (Rickman & Davidson, 1994). Further, socially phobic adults retrospectively reported being held back socially by their parents and told to be particularly aware of the opinions of others (e.g., Bruch, Heimberg, Berger & Collins, 1989). Additionally, DeRoss, Marrinan, Schattner and Gullone (1999) and Ge, Conger, Lorenz, Shanahan and Elder (1995) found that father and not

mother depression was significantly associated with adolescent depression and fathers' angry and withdrawn behaviour predicted distress disorders in young children (Katz & Gottman, 1993). These examples show a consistent relationship between parent and child emotional behaviours. However, as introduced earlier, it is difficult to separate parental temperament factors from environmental factors such as the parent-child attachment relationship or parenting style (e.g., Erickson, Sroufe & Egeland, 1985).

How much of this is a reaction to the child's behaviours and how much is purely parent temperament is unclear. van der Boom (1994) found that infants of different temperaments appear able to elicit differential care from parents. Equally, a parent's behaviour could modulate an infant's proneness to distress. This implicates a reciprocal influence. Adding to this idea, sensitive children appear to react differently to their parents, depending upon their parent's emotional disposition. For example, BI children have been found not to be able to handle criticism well from their anxiety disordered mothers but were unaffected by a mother's criticism if she was not anxiety disordered (Hirschfeld et al., 1997b). Additionally, Nachmias, Gunnar, Mangelsdorf, Parritz and Buss (1996) found that inhibited infants experienced a stress response to novelty only when they were insecurely attached to their parent. Both of these latter findings may be related to the attachment relationship. This also brings up the related question of what role the parent plays in helping the child to feel in control of their emotions. The relationship between these constructs will be discussed further in the Chapter 8.

Parenting styles can also alter the expression of temperament (e.g., Muris, Steerneman, Merckelbach & Meesters, 1996). As discussed in Chapters 7 & 8, parents may want to protect a vulnerable child from stress by reducing the amount of exposure or by rescuing the child faced with stress-related novelty. In the process, they may reduce the child's opportunity for mastery

(Rubin & Burgess, 2001). Kagan et al. (1994) found that a balance between setting limits and teaching coping strategies in a supportive way, was more effective at reducing fear and inhibition in vulnerable children than either just comforting, or, at the other extreme, imposing socialisation demands in a critical way. Learning self-regulation skills (Thompson, 2001) as well as having adequate social and emotional support (Compas, 1987; La Greca, Silverman, Vernberg & Prinstein, 1996) may modify the risk for the temperamentally vulnerable children.

## **5.7. Chapter Summary**

Accumulated evidence presented in this chapter suggests that temperament has a considerable biological component and that it remains generally stable throughout life. It affects choices and creates unique environments for each individual as they interpret situations which they encounter (Plomin & Caspi, 1999). Despite the evidence that shy and inhibited children tend to grow up to be withdrawn adults who would like to be more involved with life—especially the males (e.g., Caspi, 2000; Caspi & Silva, 1995; Gest, 1997), research has shown that by no means do all children who are emotionally reactive or are reluctant to try new things develop anxiety disorders. Could the key component as suggested by Chorpita and Barlow (1998; Chorpita, Brown & Barlow, 1998) be the feeling of having no control over self or others? Or is it environmental adversity itself that creates anxiety and later depressive disorder? For example, could children learn to be fearful in an environment where their parent displays fear and uncertainty (modelling) or could parent behaviours (e.g., overprotection, rejection or sensitive parenting) or family characteristics (e.g., cohesion, conflict, sociability) influence the relationship between an inhibited temperament and future outcomes? How child and parent temperament affects this overall relationship is considered in the present study. The discussion now turns to the role of general environmental vulnerability or risk.

## **CHAPTER 6.**

### **INTRODUCTION TO EARLY ENVIRONMENTAL VULNERABILITY/PROTECTION**

#### **1.11.Chapter Overview**

This chapter addresses how environment influences the development of distress in children. It begins with a brief discussion of elements that make this topic so important to explore, namely the permanent effect of the environment on the developing brain. It proceeds to examine Barlow's (2000, 2002, Chorpita, 2001, Chorpita & Barlow, 1998) conceptualisation of environmental vulnerability. It continues with a brief description of other theories related to the development of distress which extend Barlow's conceptualisation. Following this general introduction, specific topics related to environmental vulnerability, namely the attachment relationship, parental qualities, general family environment and cognitions of perceived control and competence will be discussed in separate chapters.

#### **1.12.The Effect of the Environment on the Developing Nonhuman Brain**

The developmental psychopathology perspective sees environmental impact as varied and accumulative, offering both risk and protection for future distress as the child grows (Vasey & Dadds, 2001). This cumulative effect has been seen most clearly in studies with animals. The impact of stress experiences and nurturing, supportive experiences on the temperamentally vulnerable animal's brain function has been able to be observed directly. Evidence from studies with infant rats and monkeys has found that stress in early life associated with uncontrollable, unpredictable life circumstances

leads to chronic anxious apprehension or negative affectivity as well as increased corticosterone levels (a hormone associated with stress reactions) in the brain (e.g., Coplan, Trost et al., 1998; Heim & Nemeroff, 1999; Ladd et al., 2000; Mineka, 1985, Mineka, Gunnar & Champoux, 1986). In monkeys, experiences of mastery or control as well as social support from monkey peers, appears to protect them from future anxious reacting as well as encourage exploration of novelty (Mineka et al., 1986). Additionally, both naturally reactive and environmentally stressed young animals (both rats e.g., Francis, Diorio, Liu & Meany, 1999; Heim & Nemeroff, 1999 and monkeys e.g., Suomi, 1999, 2000) tend to respond positively to an optimally nurturing environment by becoming calmer. Subsequently, they are then more likely to become nurturing parents themselves (Francis, Diorio, Liu & Meany, 1999; Suomi, 2000).

Further, for the rats, there appear to be permanent brain effects. Optimally nurtured rats have been found to develop a permanent increase in the concentrations of receptors in the emotional centres of the brain (Francis et al., 1999; Liu et al., 1997) suggesting a nongenetic/environmental means of changing early vulnerability. With both controllability and nurturing dimensions appearing to have such a fundamental effect on nonhumans, it would be important to examine the environmental effect of such influences on children, including those who are biologically vulnerable.

### **1.13.The Capacity of the Human Brain to be Influenced by the Environment**

Most investigators agree that the capacity to regulate emotion and the ability to interact socially are critical to the maintenance of emotional security (Chorpita & Barlow, 1998) and to adaptive functioning (Campos, Barrett, Lamb, Goldsmith & Stenberg, 1983). Recent advances in developmental neuroscience suggest that, in infancy and early childhood, there is rapid growth and modification of the brain areas which promote self-

regulation such as areas where emotion, attention and memory develop (Nelson & Luciana, 2001). Since brain structures associated with emotionality develop before those of higher cognitive functions like reasoning, planning and organising (Nelson, 2000), the success of the neurodevelopment of emotion may have implications for the development of cognitive functions (Blair, 2002). While some neural development happens mostly at critical periods (e.g., speech and vision), the neurological structures associated with the higher cognitive functions display plasticity in responding to experience for a long time, even possibly into adulthood (Nelson, 2000). For example, limited evidence exists to suggest that a course of cognitive-behavioural therapy with adults with OCD produces regional brain activity changes that are comparable to the changes produced with medication (Baxter et al, 1992).

With advances in non-invasive neuroimaging technology, it has been possible to observe what activity is present in the newborn that either stays the same or changes over time and with treatment (Davidson & Fox, 1989). With neurological research pointing to evidence that the environment has the capacity to have a major impact on psychological outcomes, it would be important to explore what factors in the environment provide the greatest potential for both risk and protection for distress in childhood and how these factors relate to perceptions of control.

#### **1.14.Environmental Influences on the Development of Childhood Distress Disorders**

Previous chapters introduced the topics of distress disorders in children, their relationship to each other and to Negative Affectivity and how they pertain to the study of risk and protection within the area of developmental psychopathology. Additionally, the emotionally reactive, behaviourally inhibited temperament has been implicated as a risk factor for distress disorder development. However, as discussed in Chapter 4, there is no

direct link between temperamental risk and distress disorders in children. Although inhibited children tend more often to become quieter and less adventurous adults (e.g., Caspi, 2000) and a child's temperamental disposition (i.e., emotionality or shyness) is seen to influence perceptions and choices (Plomin & Caspi, 1999), these do not fully account for the development of distress disorders.

As introduced earlier, studies examining behavioural genetics have been able to determine that at least 50% of variance in outcomes with twin studies is accounted for by environmental factors (Plomin & Caspi, 1999). Study results have been mixed regarding the amount of shared environment (e.g., family and parent influence) compared with unshared environment (e.g., different peer relationships, recreational experiences) that is able to account for distress in children. Studies indicate that shared environmental factors have a stronger influence on children (Stevenson, Batten & Cherner, 1992; Thapar & McGuffin, 1995; see also Eley, 2001 for review) than on adults (e.g., Kendler et al., 1995; Daniel & Plomin, 1985) and are most detectable when the child is living at home (Rapee, 2001). Following from this, it was expected that family and parenting factors would have considerable influence in the present study.

### **1.15.The Early Environmental Vulnerability Component of Barlow's Model**

After biological vulnerability, the second of the three main vulnerabilities in Barlow's model of anxiety aetiology is a generalised form of psychological vulnerability that results from early experiences of environmental adversity. Barlow (1988, 1991, 2000, 2002, Chorpita and Barlow, 1998) defines this generalised psychological vulnerability as a "chronic inability to cope with unpredictable, uncontrollable negative events, and this sense of uncontrollability is associated with negatively valenced emotional responding" (Barlow, 2002, pp.254). Specifically, Barlow postulates that

uncontrollable and unpredictable early experiences lead to low perceptions of control and increased neurobiological activity (e.g., Gray's BIS) which sensitise an individual to anxiety and related negative affective states. The accumulation of these early emotionally uncontrollable experiences is then thought to foster a belief system or cognitive template that the world is a dangerous place and the individual has no control over it. Four early environmental adversities which have been theoretically linked to anxiety are: the attachment/caregiver relationship, the individual vulnerabilities of the parent, a psychological controlling/rejecting parenting style, and a family environment characterised by high conflict and enmeshment, lack of cohesion, non-democratic decision-making and social isolation.

Barlow further contends that in individuals with a pre-existing biological vulnerability to be emotional, the condition of their early environment is crucial to their future adjustment. He suggests that the relationship between biological vulnerability and generalised psychological vulnerabilities based on early environmental adversity leads to the "clinical syndromes of generalised anxiety disorder and depressive disorders" (Barlow, 2002, pp.279). What is particularly detrimental to a biologically vulnerable child is the way in which an uncontrollable, adverse environment facilitates the vulnerable child's natural tendency to retreat from potentially threatening situations. With retreat, comes lost opportunities to learn or have experiences of success with positive coping strategies. They are left with an unconscious belief system (template or schema) that they are unable to have any impact on life events. Repeated avoidance or failure to negotiate life challenges may then result in the development of distress disorders. Barlow believes that the combination of a consistent, predictable parent, sensitive to their child's tendency to avoid stress and a family environment full of opportunities to experience control encourage a biologically reactive child to learn to manage their emotions and life circumstances. This combination then protects the child from distress disorders in the face of subsequent crises. In other words, a child that can experience a sense of

mastery and control may have developed the courage to learn to face gradually more stress. Alternatively, an emotionally vulnerable child who experiences adverse events is not able to develop a sense of security and is more at risk of retreating from actual or perceived stress and subsequently suffering from anxiety or depression.

In summary, Barlow's theory (2002) contends that it is the synergy between the biological and psychological vulnerabilities including the presence of low perceptions of control, which sets an individual up for the possibility of disorder manifestation. Without the general biological vulnerability, the personality style derived from the general psychological vulnerability would manifest as "pessimism, low self-confidence and self-esteem and lack of initiative" (pp.277). Combined biological and psychological vulnerabilities would produce "anxious apprehension" which would lead to a "neurotic personality" (Barlow, 2002) and the greater risk of development of generalised anxiety disorder and depression.

### **1.16.Environmental Adversity: Related Models and Research**

A number of theorists view conditions of early environment as crucial to future adjustment and the potential development of distress disorders. Various theorists and researchers, with varying amounts of supporting empirical evidence, emphasise different aspects of the environment they believe hold the most weight. However, all include the feelings of competence and control either implicitly or explicitly as mediators of outcomes or mechanisms for healthy adjustment. The most simply articulated is Steinberg and Avenevoli's (2000) suggestion that the key process linking adverse environment to anxiety is repetition. They assert that repeated perceived stress with repeated avoidance leads to reduced control and eventually heightened anxiety. Conversely, stress linked to repeated support leads to a heightened sense of control and a reduced likelihood of anxiety becoming a chronic problem.

Attachment and control theorists (e.g., Bowlby, 1988; Skinner, 1996; Weisz, 1986b; Young, 1999) suggest that, in childhood, gaining control as a result of the successful negotiation of stress will facilitate the development of cognitive schemata that regards the self as competent, others as trustworthy and the world as being controllable. Manassis and Bradley (1994) put attachment and temperament together in a more precise way. They suggest that it is the interaction between temperamental vulnerability and attachment of both the child and their caregiver in the face of environmental factors like the dyad's openness to family and peer support which determines the state of inner security the child develops. This then influences the development of anxiety.

Rubin and Burgess (2001) cite a number of research findings to support their contention that the relationship between parent vulnerabilities and child temperament is crucial in determining how the child will interact with peers. That is, for the emotionally vulnerable child, a consistent, sensitive adult who supports confronting social difficulties is what a shy child needs to learn the social competency skills necessary to become emotionally adjusted and to avoid later social isolation. Barlow, Bowlby and Kagan and their colleagues also suggest that overcoming a vulnerable temperament requires not only a parent who is emotionally supportive (a reliable, secure base) but also a parent who is cognitively supportive. They contend that the parent needs to be able to encourage the child to confront rather than retreat and to be able to step in to help only when the child has reached the limit of their present repertoire of skills.

### **1.17.Chapter Summary**

This chapter has introduced theory and research in relation to environmental risk for distress disorders. Evidence linking the impact of the environment to the developing brain was cited. Additionally, the general environmental

vulnerability component of Barlow's (2002) theory was explained and reviewed in light of other related models and in relation to control-related perceptions. The theme of personal control continues in the following chapters which focus on different aspects of environmental vulnerability. The next chapter explores attachment relationships as the first meaningful encounter the child has with their external environment and where a sense of control begins.

## **CHAPTER 7.**

### **THE ATTACHMENT RELATIONSHIP—THE FIRST CONTINUOUS ENVIRONMENTAL INFLUENCE**

#### **1.18.Chapter Overview**

The present chapter addresses three themes in relation to distress disorder aetiology. The first is how the attachment relationship provides environmental risk and protection, especially for a temperamentally vulnerable child. The second is the attachment relationship as a precursor to the development of control-related perceptions. The third is how beliefs formed and behaviours learned by the child based on the initial attachment relationship might affect the quality of peer relationships, adult partner relationships and later parenting styles.

Accordingly, this chapter begins with Bowlby's definition and theory of attachment. Then there is a description of how Bowlby's model has been operationalised and the infant-mother attachment relationship has been assessed using the Strange Situation Categories developed by Ainsworth, Blehar, Waters and Wall (1978). These categories and related research are discussed as they apply to outcome research in this area. Bowlby's working model is then discussed particularly as it relates to children in middle childhood, to adult partner relationships, and parent-child relationships (e.g., Ainsworth et al., 1978; Main, Kaplan & Cassidy, 1985; Hazan & Shaver, 1987; Bartholomew & Horowitz, 1991). Then, research which links Bowlby's attachment model to other constructs in Barlow's (2002) model of distress disorder aetiology is examined.

### **1.19. Bowlby's Theory and Definitions of Attachment**

Bowlby was the first to present a coherent model of the development of the bonding process between mother/caregiver and infant and the perpetuation of the species functions that this bond ultimately serves. He believed that human infants have an innate predisposition to touch and cling to another human being, as basic as the need for food or physical warmth. This view was revolutionary for the time as it contrasted with the Freudian view that emotional gratification came as a consequence of biological needs being met. Although researchers have since found that reciprocal mother-infant interaction is more complex than the species-specific behavioural systems Bowlby first proposed (Page, 1979), Bowlby's theory and extensive writings (1969/1982, 1973, 1980, 1988), provided a framework for understanding how individuals relate to each other throughout life (Thompson, 2001).

Bowlby (1969/1982) defined the attachment system as the dynamic bond between mother and child that would "tend to reduce the risk of the individual coming to harm...causing anxiety to be allayed and a sense of security to be increased" (pp. 374). This includes infant attachment behaviours like reaching, smiling, crying, that are intended to elicit psychological and physical care from the mother. In other words, he hypothesised that attachment behaviours from the infant along with contingent responding from the caregiver would provide the infant with the emotional security required to explore and learn. This reciprocal relationship then sets the stage for subsequent cognitive, affective and relationship behaviours.

### **1.20. Ainsworth's Operationalisation of Bowlby's Theory**

Ainsworth was the first to devise a way of applying Bowlby's attachment theory to the relationship between caregivers and their children. Based on 12-month old infant responses to separation and reunion with their

caregiver during a structured laboratory procedure, Ainsworth identified three patterns of infant attachment classifications: secure (B), anxious-ambivalent (C) and avoidant (A). The group of children classified as secure were the largest group. They became less exploratory upon separation and somewhat subdued or distressed in their mother's absence. Upon their mothers return, they sought comfort from their mothers, were effectively soothed and returned to play. At home, they did not appear to exhibit much undue protest or anxiety. Infants classified as anxious-ambivalent showed some anxiety in the preseparation time, were intensely distressed when their mother left and while she was gone (see also, Sagi, Van IJzendoorn & Koren-Karie, 1991). They were also observed to be distressed and angry upon their mother's return and were ambivalent about contact with her. The contact did not effectively soothe them or allow them to return to play. At home, these infants appeared to be anxious and angry. Infants classified as avoidant seemed undisturbed by their mother's departure (though subsequently Spangler and Grossman, 1993, found they had elevated heart rates and a higher rise in cortisol levels than the secure infants) and tended to turn away from or ignore their mother in a prematurely self-reliant way when she returned. At home, most of these infants were seen to be distinctly angry with their mothers and anxious about where she was. Solomon and George (1999) suggested that these two categories of insecure children were each in different ways vulnerable, with the anxious-ambivalent children avoiding exploration and the avoidant children becoming shut off to external cues of danger and, therefore, more exposed to it.

In 1990, Main and Solomon (1990 cited in Main, 1996) added a fourth category of infant attachment to accommodate those infants who did not fit the other categories. This category was labelled disorganised (D) and was characterised by the lack of a consistent strategy for proximity seeking under stress. These infants exhibited behaviours such as a rapid vacillation between approach and avoidance, sudden extremes of affect and prolonged freezing or 'go slow' behaviours as well as expressions of fear and

disorientation at the return of their mother. These children appeared to experience their primary caregivers as being both the source of distress and source of anxiety relief which appeared to create an insolvable dilemma (Main & Solomon, 1990). Spangler and Grossman (1993) showed that these infants had the sharpest rise in saliva cortisol levels after the Strange Situation procedure, indicating that they were stressed. Research found this category to be most consistently related to psychopathology later in life (for more detail see, Solomon & George, 1999). However, Thompson (1998) warned that more research was required to establish this category as a member fully compatible with the original Strange Situation classifications.

The distribution of these attachment categories has been discovered through meta-analysis of a number of studies. van IJzendoorn's (1995) meta-analysis found the following distribution results: 55% secure, 23% ambivalent, 8% avoidant and 15% disorganised. Similarly, in summarising research of the past two decades on the stability of the Strange Situation for initial categories, Thompson (1998) found that typically middle class samples had 65% secure, 15% anxious-ambivalent, 20% avoidant. He further noted that secure patterns were more stable than insecure ones and higher income samples showed more stability than lower ones. Additionally, Howes (1999) reported that children showed different attachment styles with different caregivers in the first year of development but, as they grew older, appeared to show a consistently similar attachment style with others as they did to their primary caregiver.

Ainsworth's (1979) classifications generated a number of studies which supported Bowlby's theory that securely attached children were more socially competent and cognitively adaptive than insecurely attached children (Thompson, 1998). Longitudinal data from several early studies indicated that children assessed as secure at twelve months were, at ages two, three, and six years old, more cooperative, more empathetic with peers, less aggressive and less avoidant with adults including their mothers

(Bretherton, 1985). They also appeared to be more curious, explored more intensely for longer and were more resilient, self-directed and interested in problem-solving challenges (Ainsworth et al., 1978; Meins, 1997). Thompson's (1998) extensive review also reported that secure attachment assessed at 12 and 18 months related to later social competence, empathy with peers, self-confidence and ego-resilience (defined as the capacity to react in a flexible, resourceful and consistent manner in problem-solving; Block & Block, 1980).

Other findings indicate securely versus insecurely attached children have advantage in the face of stressful events. Main and Weston (1981) found that securely attached preschoolers were more able to interact appropriately with a clown with their mothers present than were insecurely attached children. Conversely, insecure children tended to show inappropriate affect and disorganised behaviours. Meins (1997) found that secure four year olds were more able to appropriately use their mothers to solve a problem. Also, Kerns, Tomich, Aspelmeier and Contreras (2000) reported that self-reported securely attached 9-12 year olds were observed to display less anxious and avoidant coping strategies with their parents compared to their insecure counterparts. This suggested that the security they held perhaps allowed them to talk more directly with their parents. Taken together, these findings and many others (Carlson & Sroufe, 1995; Jacobsen & Hofmann, 1997; Waters, Wippman & Sroufe, 1979) have contributed significantly to Bowlby's theory that a secure base is important for both emotional and cognitive growth. Perhaps, as Bowlby asserted, a secure base of attachment facilitates feelings of security and control which allow children to relax enough to do their best thinking and problem-solving which in turn, increases confidence.

### 1.21. Bowlby's Working Model

According to Bowlby (1969/1982), children internalise their repeated experiences with caregivers so that early attachment relationships eventually become unconscious internal representations or templates for future relationships. These core beliefs and expectations form the working models that guide interactions with the primary caregivers and then other attachment figures that present themselves during life (Bowlby, 1988). Main, Kaplan and Cassidy (1985) defined the working model as "a set of conscious and/or unconscious rules for the organisation of information relevant to attachment and for obtaining or limiting access to ...information regarding attachment-related experiences, feelings and ideations" (pp. 66-67). Bowlby (1973) identified two major components of *working models* of attachment: "(a) whether or not the attachment figure is judged to be the sort of person who in general responds to calls for support and protection; [and] (b) whether or not the self is judged to be the sort of person towards whom anyone, and the attachment figure in particular, is likely to respond in a helpful way" (pp. 204). That is, the first component concerns the child's view of whether others are accessible and trustworthy to help. The other concerns the child's view of their own lovability and worthiness to be helped. Research data has shown that children classified as anxious-ambivalent tended to have a negative view of themselves, though data were not conclusive for those children classified as avoidant (Main Kaplan & Cassidy, 1985).

It was not until the late 1980's that other theorists and researchers went beyond the identification of observed attachment styles to elaborate on Bowlby's working model per se (see Brennan, Clark & Shaver, 1998 and Hess, 1999, for reviews). Then, it was not until the 1990's that these models were applied to children in middle childhood (see Kern, Tomich, Aspelmeier & Contreras, 2000 for review). Specific application of working

models will be discussed in Section 7.4.3. However, because these models built on Bowlby's, his working model is now elaborated.

### **1.21.1. Working Model Phases—The beginnings of a sense of control**

Bowlby (1969/1982) distinguished, and Ainsworth's (1972) research supported, the existence of four phases of development to the child-mother attachment. Three of the phases appear to occur within the first year and the last at the end of the third or into the fourth year. The first two phases prepare the infants for exploration as they learn whether to trust that their attachment behaviours (e.g., crying, reaching, smiling) elicit a consistent response. The third phase involves locomotion; the toddler's understanding of object permanence (the mother existing even though she is not in the room) and the ability to use one environmental cue as a signal that another event follows (Piaget, 1954). Together, these help the toddler to explore further, to anticipate a relatively consistent mother's next action and to adjust plans in keeping with her expected behaviour (Bowlby, 1969). Bowlby (1969) and Ainsworth (1972) suggested it was here around the age of three where the toddler gained more of a sense of predictability as they formed an inner representation of their attachment figures and of themselves within the relationship. Phase 4 was labelled a 'goal-corrected partnership' (Ainsworth, 1972; Bowlby, 1969): a more complex but flexible, mother/child reciprocal attachment relationship and the basis from which mature attachment relationships, like romantic attachments are thought to grow (Bowlby, 1969). This stage includes the lessening of the egocentric position of the child to the point that they are capable of looking at the world from their mother's viewpoint and able to anticipate her feelings, motives and plans. With this information, the child is thought to be more able to feel a sense of control as they are learning how better to persuade their mother. With the development of communication skills and the understanding of symbolic representations of self and others, interactions become more varied and complex, representations more sophisticated. However, at this

stage, overt proximity-seeking is still a feature. With more experiences of successful negotiations at this fourth stage, it was postulated that the child develops a feeling of being valued by at least one other and this feeling contributes significantly to that child feeling that the world is predictable and that they have some control within it. Bowlby (1973; Bretherton, 1985; Sroufe & Fleeson, 1986; Thompson, 1998) believed that as children progress through life, they continue to view the world and relationships through what develops as an unconscious filter, seeking confirmation of their beliefs as they elicit from others what they expect to see. Cicchetti and Cohen (1995, Cicchetti & Toth, 1997) further suggested that these beliefs contribute to personality development and set the stage for relational experiences with peers, in adulthood and subsequently as parents.

### **1.21.2. Bowlby's Working Model as Specific to Middle Childhood Onwards**

Middle childhood was targeted by Bowlby as being a particularly important time of life. By middle childhood, children have an increased understanding that their relationship with the attachment figure continues, regardless of physical proximity (Main, Kaplan & Cassidy, 1985). This allows them to maintain a close tie with the attachment figure (s) while spending more time with peers and others with whom there is potential to form additional attachments (Bowlby, 1973; Sroufe & Fleeson, 1986). Although they do not require proximity to their caregiver as often, they continue to report their parents as being their primary support figures (Levitt, Guacci-Franco & Levitt, 1993; Reid, Landesman, Treder & Jaccard, 1989). Bowlby (1988) posited that the goal of the attachment system from middle childhood onwards becomes the *availability of*, rather than the *proximity to*, the primary caregiver. This availability is dependent on the openness of the communication between the youth and the attachment figures, physical accessibility and responsiveness to requests for help (see also Bretherton, 1985). Bowlby (1973) stated that "...the family experience of those who

grow up to become relatively stable and self-reliant is characterised not only by unfailing parental support when called upon but also by a steady yet timely encouragement toward increasing autonomy..."(pp. 322). He extended the importance of the family further to state that "the inheritance of mental health and mental ill health through the medium of family microculture...may well be far more important than is their inheritance through the medium of genes" (Bowlby, 1973, pp.323). It is the case then that the attachment relationship is thought to be more influential for the future than temperament alone. This is discussed further in Section 7.7.

Further, Bowlby believed that by middle childhood the child's attachment expectations would determine the attachment choices they would make. He contended that children who experienced relatively consistent, predictable and sensitive caregiving were likely to develop a secure working model and would view the self as loveable and competent. They would expect others to respond positively and, in turn, would be able to relate to others in a positive and open way. This then would further encourage support and maintain positive beliefs about self, others and relationships.

In contrast, children who had experienced rejection or inconsistent, unpredictable responses from caregivers were more likely to develop an insecure working model of the self as unlovable and incompetent and of others as being unreliable, rejecting and untrustworthy. These children would be distrustful of relationships and doubt their worthiness, so would tend to be either excessively preoccupied with maintaining proximity to an attachment figure (i.e., a friend) or avoid closeness (Ainsworth, Blehar, Waters & Wall, 1978; Main Kaplan & Cassidy, 1985). Research has shown that excessive proximity-seeking may confirm insecure feelings as insecure children's requests for help were significantly more likely to be ignored by adults than requests from secure children (Turner, 1993).

Moreover, these insecure children may be candidates for depression and anxiety (Bowlby, 1973). Longitudinal research more recently has found that preschoolers' insecure attachment relationships with their mothers predicted more internalising behaviours and more heavily dependent relationships with best friends at 8 years old (Booth, Rubin & Rose-Krasnor, 1998). Another longitudinal study reported similar results. Warren, Huston, Egeland and Sroufe (1997) found that an anxious-ambivalent attachment style in infancy predicted anxiety at age 17, suggesting that attachment security has long-term implications. With research generally supporting continuity of attachment security from infancy to at least early adulthood (Hamilton, 2000; Waters, Merrick, Treboux, Crowell & Athersheim, 2000) and attachment security in middle childhood predicting later adjustment (e.g., Jacobsen & Hofmann, 1997; Kern, Tomich, Aspelmeier & Contreras, 2000), it appears that attachment security may provide the foundation for later cognitive development.

### **1.21.3. Bowlby's Working Model and Adult Models of Attachment**

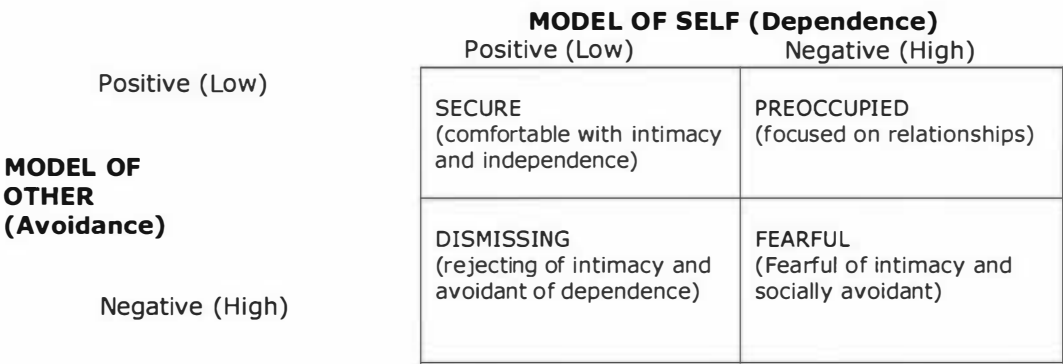
Bowlby saw the quality of adult friendships and romantic attachments to be derived from a self/other working model generated in childhood. Others have agreed. Allen and Land (1999) emphasised that adolescents and young adults continued to use their attachment figures as a secure base from which to expand their increasing autonomy. Additionally, it was suggested that partner attachments were formed based on earlier attachment experiences (Hazan & Shaver, 1994) and from resultant experiences of later friendship and caregiving (Marvin & Britner, 1999). However, it was not until the 1980's that models of adult attachment were created.

Three major models of adult attachment relationships were conceptualised to assess adult perceptions of their attachment relationships. All of these models, however, assessed different aspects of adult attachment. First,

Main, Kaplan and Cassidy (1985) assessed an adult's current attachment 'state of mind' using discourse analysis of the adults' descriptions and evaluations of their childhood attachment relationships (with the Adult Attachment Inventory; AAI; George, Kaplan & Main, 1987; Main & Goldwyn, 1988; cited in Main 1996). Second, Hazan and Shaver (1987) assessed current romantic relationships initially using prototype descriptions to represent Ainsworth's secure, anxious-ambivalent and avoidant categories of attachment. Third, Bartholomew and Horowitz (1991) looked at adult relationships more generally using prototype descriptions but based them directly on dimensions from Bowlby's working model. These models conceptually correspond to infant categories (e.g., Bretherton, 1992; van IJzendoorn & Bakermans-Kranenburg, 1996) and have been shown to be related to pathological functioning (e.g., Fonagy et al., 1996). The first two models mentioned are not discussed here owing to the current research focus on the third methodology. The third model (Bartholomew & Horowitz, 1991) is now described as it is used in the present study. Brief reviews of the first two methodologies are available for the interested reader in Appendix B.

Bartholomew and Horowitz (1991) worked directly from Bowlby's concept of working models to create a prototype model of adult attachment relationships. They operationalised Bowlby's (1973) characteristics of the primary attachment relationship using the two key dimensions of his theory: 1) concerning the individual's image of others and 2) concerning the individual's image of self (described in section 7.2). Accordingly as in Figure 7.1, securely attached individuals are thought to have a positive model of both self and others while preoccupied (anxious-ambivalent) individuals have a negative model of self and a positive model of others. They posited that avoidant individuals either were dismissing (having a positive model of self and a belief that they didn't need intimate relationships with others) or fearful (had a negative model of self and others in their desire for but fear of intimacy). Thus, the two subcategories of avoidant style (fearful and

dismissing) are thought to be similar in terms of avoidance of others but differ in terms of acceptance by others. Likewise, the preoccupied and fearful styles are thought to be dependent on others to maintain their own sense of self-worth: the fearful staying away to minimise being disappointed by others and the preoccupied tending to seek out others to fulfil dependency needs.



**Figure 0.1. Model of Adult Attachment (adapted from Bartholomew & Horowitz, 1991).**

Self-report prototype descriptions based on this model were validated against results of a semi-structured interview, self and peer reports of self-concept and sociability and also against a measure of early family relationships (Bartholomew & Horowitz, 1991). Griffin and Bartholomew (1994) found that the two dimensions, dependence and avoidance together uniquely predicted self-reported interpersonal dependency after accounting for the personality factors of the Five Factor model (McCrae & Costa, 1987). Others too found that the model could not be reduced to a measure of temperament or personality (see review by Vaughn et al., 1992). Because of its versatility in relating to different models and measures of adult attachment (i.e., self-report, other-report, state of mind and independent judge report), Griffin and Bartholomew (1994, see also Bartholomew & Shaver, 1998 for review) suggested that this prototype might be used as an organising frame for viewing adult attachment.

The present study used a downward extension of the adult measure for the children (Thurber & Sigman, 1998), the original measure for their parent (Bartholomew & Horowitz, 1991) and scored both in the same manner to obtain a relative score of attachment security for both. While the measures can not be reliably compared to other measures with different domain focus (e.g., romantic relationships), method (e.g., interview, Q-sort) or categorisation systems (Bartholomew & Shaver, 1998), they are able to be used in conjunction with other indicators to contribute to the aspects of environmental risk for the development of anxiety and depressive disorders. In addition, while concerns have been voiced (Griffin & Bartholomew, 1994; Levy, Blatt & Shaver, 1998), the self-report method has been shown to have construct and criterion-related validity (see Chapter 12).

#### **1.21.3.1. Research Generated from the Self/Other Paradigm**

The use of the self/other paradigm in child research has been limited. Only two studies were found that used the Bartholomew and Horowitz (1991) prototype model specifically with children. Both found attachment security to be significantly related to anxiety and depression symptoms, caregiver acceptance and perceptions of control in a study of homesickness in 12 year old boys (Thurber & Sigman, 1998) and 8-16 year old girls (Thurber & Sigman, 1999) at residential camp.

For adults, the studies have been more plentiful and seem to indicate that secure and insecure children may grow to be secure and insecure adults and act according to the working model beliefs learned in childhood. Evidence is mounting that young people have internal working models of their beliefs about themselves and their interactions with others (e.g., Bretherton & Mulholland, 1999; Thompson, 2001) and that these models affect how they continue to interact as adults.

Using the self-other paradigm, Kobak and Sceery (1988) assessed the self and other-representations of young adults. They found that those assessed as being secure saw themselves as being relatively free of distress and others as supportive, while those assessed as being dismissing (avoidant) saw themselves as relatively free of distress and others as unsupportive. On the other hand, those who were preoccupied saw themselves as being distressed and others as supportive. These preoccupied adults also reported being more anxious and depressed than secure adults (Mikulincer, Florian & Weller, 1993)

When applied to more specific aspects of partner relationships, results were also consistent with the Bartholomew and Horowitz (1991) model. A number of studies showed that differing attachment styles affected support-seeking behaviours. Dismissing adults reported that they sought support when stressed less often compared to secure adults (Mikulincer, Florian & Weller, 1993). Corroborating this finding, dismissing adults were observed to seek less support from romantic partners as their level of stress increased (Simpson, Rholes & Nelligan, 1992). On the other hand, preoccupied adults complained more in an effort to seek support (Simpson et al., 1992).

In assessing how these attachment prototypes sought and gave support to others in an experimentally stressful situation, Collins and Feeney (2000) found, with dating couples, that secure support-seekers more directly sought support which more often led their partner to offer helpful caregiving. This then resulted in improved mood for the support-seeker. By contrast, having a dismissing (avoidant) attachment style predicted deficiencies in the individual's support-seeking while having a preoccupied attachment style predicted a reduced ability of the individual to give support. In a study relating attachment style to relationship-centred anxiety, Cafferty, Davis, Medway, O'Hearn and Chappell (1994) found that secure attachment was associated with more positive and less negative affect, less conflict and more marital satisfaction after a forced separation than was a preoccupied

attachment style. Furthermore, Feeney (1998) found that secure adults responded to temporary separation from a partner more with feelings of security, described more coping strategies and appeared to be both realistic about the changing nature of a relationship and their ability to return to it. In contrast, insecure adults tended to perceive support from others as being beyond reach (Davis, Morris & Kraus, 1998; Kobak & Sceery, 1988; Ognibene & Collins, 1998), themselves as being less self-confident, less psychologically well off and less able to function socially (Diehl, Elnick, Bourbeau, Labouvie-Vief, 1998).

As well as differing in their ability to give and accept support and generally cope with relationship stress, individuals' attachment styles also appear to affect the way they use and receive touch. Brennan, Clark and Shaver (1998) found that the secure and preoccupied groups scored high on using touch as an expression of affection and low on the touch aversion scale, yet both of the avoidant groups (the dismissing and fearful) were more aware of touch deficits in their relationships. However, while the securely attached individuals used touch appropriately, the preoccupied individuals used touch to seek care and desired more touch than they received. Dismissing individuals apparently did not desire touch and fitted Bowlby's description of being "compulsively self-reliant" (Brennan et al., 1998). This of course calls into question how effective an insecure adult would be at nurturing their child.

In addition to problems specifically with touch, insecure adults appear to have views of their own parents which would make it hard for them to feel nurtured and consequently be nurturing parents. Insecure individuals describe their current family situation and their families of origin less positively than do secure individuals (Diehl et al., 1998). Similarly, insecure undergraduates described their parents as punitive and malevolent while secure students characterised their parents as being benevolent and non-punitive (Levy, Blatt & Shaver, 1998). Together, these findings suggest that

having a negative view of self and/or other does not make it easy for an individual to get what they need from others nor to give in a way that would cause satisfaction in an intimate relationship either with another adult or as a parent. The working model may very well be the mechanism which influences how individuals parent and may be the model that the child acquires as a result of learning within the intimate parent-child relationship.

### **1.22. Intergenerational Concordance of Attachment Security**

A number of lines of evidence have suggested that a child's attachment security is reflective of their caregivers' attachment security. Retrospective, cross-sectional and prospective accounts have shown a high degree of concordance with the attachment styles between caregiver and child (Benoit & Parker, 1994; Fonagy, Steele & Steele, 1991; Rosenstein & Horowitz, 1996; Ward & Carlson, 1995). Bowlby (1973) suggested that the unconscious nature of the internal working models of attachment guide an individual's expectations and assessments of relationships and subsequently allow them to construct other relationships based on the internal working models of self and other. Rosenstein and Horowitz (1996) agreed, adding that because working models were unconscious and resistant to change, there was little conscious effort employed when forming new relationships. Hence, unconscious beliefs would guide their behaviours toward their child and would affect the quality of that relationship. Parental behaviours would then influence the child's behaviours without either individual having the necessary awareness to alter the trajectory.

### **1.23. Attachment and the Development of Distress Disorders**

When assessing the role of attachment in a model of distress aetiology, it is important to look at the evidence. Bowlby (1973) argued that insecure attachment, especially an anxious-ambivalent attachment relationship (C), was associated with distress disorders. He suggested that insecure

attachment could result from actual experiences or threats of abandonment that shook the individual's sense of relationship security. The accompanying feelings of helplessness and lack of control over adversity could subsequently make the child vulnerable to anxiety (Thompson, 1999). Cassidy (1995; Cassidy & Berlin, 1994) also argued that increased vigilance because of threat of abandonment associated with anxious-ambivalent insecure attachment later generalised to vigilant scanning bias. This attention bias is then thought to reduce the child's exploration and development of coping skills (especially those to regulate emotions) and increase the risk for anxiety, including generalised forms (e.g., GAD). He further likened those with GAD to those with anxious ambivalent attachment in their problems with emotional regulation and their views of others as out of reach and themselves as unworthy.

Research has tended to support these theoretical assertions. Carlson and Sroufe (1995) reported in a high risk sample of school children that those classified as anxious-ambivalent (preoccupied; Bartholomew & Horowitz, 1991; Main, 1990) as infants were more likely to be victims of bullying at school age while those classified as avoidant were more likely to victimise (see also Troy & Sroufe, 1987). Further, preoccupied children were more likely to display internalising problems like withdrawal, loneliness, low self-esteem and anxiety symptoms (Cassidy, 1988; La Freniere & Sroufe, 1985; Lewis, Feiring, McGuffog & Jaskir, 1984). When considering an inpatient population of adolescents, Rosenstein and Horowitz (1996) found affective disorders and self-reported avoidant, anxious and dysthymic personality traits to be significantly associated with a preoccupied attachment organisation using the AAI. Further, a longitudinal study found that 17 year olds who were classified as anxious-ambivalent as infants were more likely than the other classifications (28% of ambivalent vs. 13% of other categories combined) to have a present or past anxiety disorder (Warren, Huston, Egeland & Sroufe, 1997). This indicates that there may be a connection between anxious attachment and anxiety.

Further studies have linked insecure attachment more generally to later distress. For example, in non-clinical populations, insecure attachment to parents was associated with higher levels of self-reported anxiety and depression both concurrently in 12 year olds (Muris, Mayer & Meesters, 2000) and longitudinally in 12 and 13 year olds in transition between primary and intermediate school (Papini & Roggman, 1992). In adolescents, insecurity of attachment has also been associated with anxiety and depression (Priel & Shamai, 1995), more than with other psychiatric conditions (Armsden, McCauley, Greenberg, Burke & Mitchell, 1990) and with higher levels of distress in threatening situations (Mikulincer, Florian & Weller, 1993). Together, these findings support the relationship between attachment style and distress disorders. However, Greenberg (1999) warned that a direct predictive relationship between the two constructs could not be assumed because there were many other environmental influences besides attachment which continually impacted upon the individual.

### **1.24.Attachment and Child Temperament**

It is difficult to judge how much of a child's behaviour can be accounted for by attachment security and how much by an inhibited temperament or other factors. Kagan (1982, cited in Sroufe, 1985), and others (Chess & Thomas, 1982) maintained that attachment classification (via Strange Situation) was influenced primarily by infant temperamental disposition. By contrast, Bowlby and Ainsworth viewed the attachment relationship (as opposed to attachment behaviours) as a relational construct (Ainsworth, Blehar, Waters & Wall, 1978; Bowlby, 1982; Bretherton, 1985). Matas, Arend and Sroufe (1978) in their early writing also reported that even though attachment classifications are based on the observation of infant behaviour, they are reflective of a history of caregiver sensitivity. Thus, although infant temperament and maternal personality are obviously involved, it is the dynamic interaction between the variables that create the attachment.

Sroufe (1985) similarly argued that temperament and attachment are “fundamentally different constructs” that refer to “different domains” operating at “different levels of analysis” (p. 12). He further suggested that confusion had arisen between the two concepts because they were essentially measuring the same behaviours (e.g., clinging, crying and infant soothability). Sroufe (1985) added that while assessment of the behaviourally inhibited temperament included only the infant’s reaction to novelty or the unfamiliar, the infant’s attachment assessment included much more. The attachment classification was derived from observations of the infant’s reaction to the mother’s return, after the attachment system had been stressed by both separation and the presence of an unfamiliar adult (Ainsworth et al., 1978). As an example, crying in the laboratory was not found to be related to attachment behaviour in the home, while avoidant and resistant behaviours during the infants’ reunion with their mothers were (Ainsworth, Blehar, Waters & Wall, 1978). Sroufe (1985) suggested that perhaps the attachment subcategories were reflective of temperamental variation but not the major categories themselves. Research findings have begun to accumulate in further support of this view. Ricciuti (1993) found in his study of twins that temperament alone could not predict later attachment security but the variable representing the split between two Strange Situation subclassifications (i.e., A1-B2 and B3-C2) appeared to be more temperamentally based. Vaughn et al. (1992) found only modest relations between measures of mother-reported preschooler attachment and temperament. They concluded that because of the low shared variance between the attachment and temperament scores (24% overlap of variance between measures) individual differences concerning attachment security could not be accounted for solely by temperamental differences. A later review also concluded that the insecure attachment relationship could not be reduced to negative temperament constructs, but temperamentally-based emotional vulnerability does appear to be a risk factor for insecure attachment (Vaughn & Bost, 1999). Barlow (2002) asserted from his review

that attachment was one of the environmental influences that had most impact on the child with an emotionally vulnerable temperament (i.e., high emotionality and shyness). Again, confirming this overall view, Warren, Huston, Egeland and Sroufe (1997) found that an insecure attachment (anxious-ambivalent-category C) at 12 months predicted anxiety disorder symptoms at 17 years while infant temperament did not.

From the evidence, it seems that child temperament and attachment security are distinct to the extent that both should be included in a model of distress disorder aetiology (see also Barlow, 2002).

### **1.25. Attachment and Parent Vulnerabilities, Parenting Style, Support**

A number of parental qualities have been seen to affect the attachment relationship between mother and child. Seifer and Sameroff (1986) found that attachment was not only affected by infant behaviours but also the parents' expectations, style and their ability to adapt to changing circumstances. George and Solomon (1999) also added parent personality and, as discussed earlier, their attachment history to the list of influences. Van der Boom (1994) found that a parent's distress behaviour (i.e., anxiety) increased an infant's proneness to distress. Teti, Sakin, Kucera, Corns and Das Eisen, (1996) found that the higher the anxiety and depression scores of mothers after the birth of their second child, the greater the drop in attachment scores (i.e., the more insecure the attachment) in their first born toddlers. This relationship was particularly strong when there was no support from a partner. However, when partner social support was present, for the anxious and depressed mothers, the toddler's attachment security was not negatively affected by their mother's problems. Similarly, Cowan, Cohn, Pape-Cowan and Pearson (1996) who studied attachment history, family interactions and child internalising behaviours over two years found that a combination of mother's attachment history and family interaction

measured when the child was 3.5 years old accounted for about 60% of the variance in the child's internalising behaviour two years later. Furthermore, a positive marital relationship increased the likelihood that a mother's insecure attachment history would not contribute to later negative parenting. In another study, partner support as well as grandmother support promoted secure attachment between mother and infant even in high-risk adolescent mothers (Spieker & Bensley, 1994).

The child's attachment relationship with fathers has not been studied extensively and often methodological problems have existed (see Marsiglio, Amato, Day & Lamb, 2000). However, some studies indicated that a father's parenting characteristics of sensitivity and warmth, found to be associated with a secure attachment relationship, could also affect child outcomes. For example, Zimmerman, Salem and Maton (1995) found that the amount of warmth and caring a father showed and the amount of time he spent with his adolescent son predicted less depression and higher self-esteem and life satisfaction in the sons. Longitudinal evidence has been confirming as well. For example, Franz, McClelland and Weinberger (1991) reported that mother-report of father's warmth when the child was five years' old predicted that individual's marital success and supportive social networks at 41 years of age.

## **1.26.Chapter Summary**

Evidence presented suggests that the relationships children form with their primary caregivers are extremely important ones. From these relationships and subsequent relationships (which have been modelled upon the qualities of those relationships), children create cognitive schemata of their beliefs about self-worthiness and about the trustworthiness of others (Bowlby, 1969; Bretherton & Mulholland, 1999). These schemata are then thought to influence and be influenced by experiences of subsequent close relationships as well as by the individual's temperamental disposition. While a secure

attachment appears to protect an individual from environmental adversity (e.g., family difficulties), an insecure attachment appears to provide risk. Evidence from varying sources indicates that those children with an insecure attachment style tend to be more at risk for adjustment problems including anxiety and depression than those with a secure attachment style. Additionally, temperamental vulnerability together with insecure attachment appears to increase risk.

Insecurely attached adults appear to have difficulty getting support from others, either avoiding because of fear of rejection or being so needy that they drive others away (Collins & Feeney, 2000; Mikulincer, Florian & Weller, 1993). These insecure adults appear also to be less available to support others because of their own need for support or their aversion to connections with others generally as well as through touch (Brennan, Clark and Shaver, 1998). Further, insecure adults appear to have a tendency to have insecure relationships with their children (Rosenstein & Horowitz, 1996). Adult self-report attachment measures confirm the existence of two particularly important dimensions of response relevant to attachment prototypes—Dependence and Avoidance (Bartholomew & Horowitz, 1991; see Figure 7.1). It is most conceivable that in adults these dimensions may relate to the psychologically controlling and rejecting parenting styles most connected with distress disorders in children (Barber, 2002; Siqueland et al., 1996; Rapee, 1997) and adults (Cassidy, 1995). The next chapter considers parental caregiving and parenting styles as risk and protection for the development of anxiety and depression.

## **CHAPTER 8.**

# **MATERNAL CAREGIVING AND PARENTING STYLES THAT PROVIDE RISK AND PROTECTION FOR THE DEVELOPMENT OF CHILDHOOD DISTRESS**

### **8.1. Chapter Overview**

The first part of this chapter explores what part of parenting protects a child from negative outcomes and looks at parental caregiving, parental sensitivity and their correlates. The second part of the chapter examines parenting styles more specifically related to the development of distress disorders. The chapter begins with Barlow and colleagues' (2002; Chorpita & Barlow, 1998) view of parenting as an environmental risk and other theoretical extensions to this perspective.

### **8.2. Barlow's View of Parenting Styles related to Psychological Risk for Distress**

Chorpita and Barlow (1998) included parental sensitivity and psychologically controlling and rejecting parenting styles in their General Psychological Vulnerability to distress disorder development (first explained in Section 6.5). Specifically, they saw parental acceptance and parental sensitivity comprising "early experience and skill with response-contingent reinforcing outcomes (i.e., control)" (p. 11) as providing protection against later emotional adversity. In other words, they believed that parents who showed acceptance and sensitivity by being consistently caring and contingent in responding to their child would allow that child to experience success in soliciting reinforcement from others and start to have perceptions of control over their environment. Equally, the parents who were less overprotective (e.g., offered a consistent secure base and age-appropriate challenges

without needing to direct solutions) provided the child with more opportunities to learn to safely manipulate their environment, learn cognitive and social skills and, in the process, gain a greater sense of control and competence. Additionally, Rapee (2001) argued that parents, who supportively encouraged bravery in facing difficult situations, teach the child that they can gain control over their world and that this reduced the possibility of developing anxiety disorders.

Conversely, parenting styles characterised by rejection (on the opposite pole to acceptance; Schaefer, 1965) and psychological control (opposite to parental sensitivity; Barber, Bean & Erikson, 2002) are seen as producing risk for distress disorders because of the child's lack of opportunity to experience personal control and competence in situations (Chorpita & Barlow, 1998). Extending Chorpita and Barlow's position, Rapee (2001) proposed that parents may become inadvertently intrusive. He hypothesised that parents of genetically anxiety-prone children who themselves were often anxious, tried to reduce the child's distress by becoming more involved and protective of the child. Contrary to parental intention, this parenting style would actually reinforce the child's perception of threat and reduce the child's perceived control, making the child more avoidant and vulnerable to anxiety. Rubin and Mills (1991) further suggested that parent and child temperaments were involved. They suggested that parents may feel guilty and embarrassed at not being able to comfort their temperamentally wary and reactive child. This could then lead to an insecure attachment relationship and to less responsive or sensitive parenting. Other aetiological theories of anxiety disorder development have concurred with Rubin and Mills and Barlow and colleagues (Manassis & Bradley, 1994; Rapee, 2001).

Empirical evidence has also supported this view. Specifically, a parent-child relationship characterised by overprotection or intrusiveness and rejection has been associated with anxiety and depression respectively (e.g., Grüner, Muris & Merckelbach, 1999; Markus, Lindhout, Boer, Hoogendijk & Arrindell,

2001; Wolfradt, Hempel & Miles, 2003). This chapter now examines these parenting components individually. Parental sensitivity and its correlates are first discussed followed by the parenting styles of psychological control and rejection.

### **8.3. Parental Caregiving: The Role of the Maternal Caregiving System**

Bowlby (1973) theorised about how parents become secure attachment figures. He postulated that the child's working models of attachment were derived to a great extent from their parents' models, developed in their own families of origin. He believed that responsive parents, who were supportive when required and able to encourage exploration and autonomy when appropriate, were also supported by their own parents when they were children. He also believed that secure parents were able to communicate openly, making their model of attachment transparent and making it safe for their offspring to question and take part in revising their parents' model of attachment. He believed that a major part of the parental role was to allow the expression of emotion and to help the child modulate emotions, especially negative ones (Bowlby, 1979, cited in Bretherton, 1995). When parents were unavailable to support their children because of their own unresolved issues from childhood, they were less likely to be able to modify their child's negative emotions or to respond to the child with empathy.

As introduced in Chapter 7, research has essentially supported Bowlby's claims, that children's attachment styles are similar to their parents (van IJzendoorn, & Bakermans-Kranenburg, 1996) and that caregiver responses reflect these attachment styles. George and Solomon (1996, 1999) are two researchers who have investigated the area of caregiving and have conceptualised a developmental and ecological model of the parental caregiver system.

#### **8.4. Development and Manifestation of the Caregiving System**

George and Solomon's (1999) model of maternal caregiving posited that childhood caregiving experiences (e.g., caring for a pet or younger child) gradually accumulated and assimilated into a working model of adult caregiving. The ultimate purpose of this system is protection of the children until the next generation procreates. George and Solomon (1999) postulated that the caregiving system is activated when caregivers perceive a situation that might be dangerous or frightening for their children. It is deactivated by physical or psychological proximity to the children and indications from them that they are feeling settled. Associated with activation is a parent's pleasure at being able to protect their children and despair, anxiety, depression and anger at not being able to fulfil the protective function (George & Solomon, 1999). The caregiver response following the activation of the caregiver system is thought to be dependent on the caregiver's conscious and unconscious assessment of cues from the child and their own sense of the threat. The quality of caregiver response and the attention they are able to give to caregiving has also been found to be influenced by other competing systems within the caregiver (e.g., sexual, affiliative, emotional systems) and life experiences (e.g., present and past attachment relationships, Pryce, 1995; perception of their infant's attractiveness, Egeland & Faber, 1984; Piantas, Marvin, Britner & Borowitz, 1996).

Environmental factors such as a mother's satisfaction with her social supports, partner relationship or economic level, have also been found to affect a caregiver's ability to care for her child and influence the quality of the parent-child relationship (Anisfeld, Casper, Nozyce & Cunningham, 1990; Kerig, Cowan & Cowan, 1993; Teti, Sakin, Kucera, Corns & Das Eisen, 1996). Cowan, Cohn, Cowan and Pearsen (1996) found that a secure attachment to a partner buffered the effect of a poor mother-child interaction (e.g., lack of warmth and overly controlling parenting style),

regardless of the mother's attachment status. Another factor affecting caregiver quality is thought to be the age of the child. The older the child the more difficult the caregiver response choice is. For example, with adolescents, the caregiver systems have been seen to be activated without the child's attachment system having been activated creating an imbalance of emotions and at times producing conflict (George & Solomon, 1999).

### **8.5. Cognitive and Emotional Components of the Caregiving System**

Research by George and Solomon (1999) concerning the cognitive representational models of caregiving has found mother responses to their children to be similar to those found by Ainsworth et al. (1978). Mothers of secure children are more flexible, adaptable and realistic in their representations when their child is threatened. Mothers of avoidant children are more guided by mild rejection, evaluating themselves and their children negatively and devaluing their children's need for closeness (see also Koren-Karie et al., 2002). They also focus more on how they see themselves performing the caregiver role (e.g., describing themselves as being emotionally engaged with their child; Koren-Karie et al., 2002) than on actually responding to the child's needs. Mothers of anxious-ambivalent children are more uncertain, finding it hard to evaluate and integrate opposite concepts of desirable and undesirable parenting and therefore seeming to be confused and preoccupied. They tend to overemphasise caregiving and emphasise their perceptions of their child's needs for attachment over their own needs. As discussed in Section 8.7., this pattern is similar to behaviours seen in parents perceived as being psychologically controlling by their anxious children (Siqueland, Kendall & Steinberg, 1996). Mothers of disorganised children tend to describe themselves as helpless to protect their children and fearful, seeing themselves as unable to control themselves, their circumstances or their children (George & Solomon, 1999). These evaluations appear also to be associated with strong emotions and

labile, dysregulated affect. Empirical evidence has suggested a link between mother's fearfulness and the expression of frightening behaviour towards the infant as being the start of disorganised attachment in the child (Lyon-Ruth & Jacobvitz, 1999). Caregiver fear has also been associated with increased stress and arousal as well as hypervigilance in infants (Perry, Potland, Blakely, Beker & Vigilante, 1995). George and Solomon (1999) suggested that the mother's helplessness overwhelms her leading her to freeze, run or act frightened in response to attachment cues from her child (Perry et al, 1995). This in turn would be thought to make the child frightened and hypervigilant and over time lead to flight, freezing, hypercompliance, numbing, aggression or defiance in the child (Perry et al., 1995). The child here would be vulnerable as they no longer could trust the consequences of seeking protection from an attachment figure (George & Solomon, 1999). It is not surprising that the disorganised attachment style is in fact associated with more psychopathology (e.g., Lyons-Ruth, 1996; see Lyons-Ruth & Jacobvitz, 1999 for review).

Having looked at what is involved in secure and insecure caregiving systems, the elements of this system are now broken down into parenting variables which may provide specific risk or protection. Attachment researchers have described sensitive parenting as a major component of caregiving (e.g., Ainsworth et al., 1978; Solomon & George, 1999) and others have argued that it is on the opposite pole to psychological control as a parenting style (Barber, Bean & Erikson, 2002).

### **8.6. Maternal Sensitivity as a Construct Related to Protection**

Ainsworth et al. (1978) defined maternal sensitivity as the ability to be in tune with the infant's signals, accurately interpret them and respond appropriately in a timely way. They suggested that sensitivity encompasses a number of behaviours from responding to distress and comforting

(emotional support) to treating the infant as having meaningful, intentional actions that are important to interpret (cognitive support).

Meins' (1997) longitudinal experiments with one to five year olds and their mothers supported Ainsworth et al.'s (1978) suggestions and observations. To illustrate the effects of the support elements of maternal sensitivity, Meins (1997) compared maternal responses and cognitive and emotional skills of a sample of children longitudinally over four years. These children had been assessed as securely and insecurely attached as infants via the Strange Situation. Meins argued that the children's ability to interact socially was due to the ability of the children's mothers to see her child as intelligent and to devise age-appropriate interactions and cognitive challenges that would further develop their emotional and cognitive skills. She also suggested that the mothers' beliefs about developing their children's skills were reflected in their language. Meins supported her contention with the observation that mothers of the secure toddlers described them according to their mental attributes and were more likely to ascribe meaning to their child's early babble. In contrast, mothers of insecure children described them more proscriptively according to their appearance or behaviour and described their child's babble as meaningless. The secure toddlers acquired language faster despite the possible mediating effects of SES. When challenged with tutoring their four year old children in a cognitive task, mothers of secure children were able to use feedback from the child to guide her verbal and physical interventions. Mothers of the insecure children were more likely to intervene physically and tell the child what to do. At age five, the children were again assessed, this time on their ability to take a physical and feeling perspective of another and their ability to understand that an individual's actions could be governed by their beliefs rather than reality. While no difference in general cognitive ability existed between the two groups, the securely attached children were able to do these tasks significantly more successfully than their insecure counterparts. This finding suggests that maternal sensitivity and the mother's focus on the

child's mental development are involved in cognitive skill acquisition (Meins, 1997). Despite a relatively small sample size ( $n = 31$ ), Meins (1997) showed that mothers of secure children are better able to take the child's perspective, be sensitive to their needs and provide appropriate support. These skills appear to result in the child being encouraged to understand their own minds and those of others. Presumably this development also fosters a sense of control in the child.

Although some have found only qualified support for the relationship of maternal sensitivity to attachment in infants (e.g., Seifer, Schiller, Sameroff, Reznick & Riordan, 1996), there is converging evidence that early maternal sensitivity and responsiveness to the child are related to later secure attachment (e.g., Ainsworth et al., 1978; Isabella, 1993; de Wolff & van IJzendoorn, 1997; Fonagy et al., 1991; Koren-Karie, Oppenheim, Dolev, Sher & Etzion-Carasso, 2002). Maternal sensitivity also seems to act independently of the mother-child biological connection in relationship to child adjustment. For example, Stams, Juffer and van IJzendoorn (2002), having followed infants adopted cross-culturally before the age of six months, found that the early mother-infant relationship predicted socio-emotional and cognitive adjustment in middle childhood beyond the effects of infant temperament, gender or parents' socioeconomic status. However, Chorpita and Barlow (1998) warned that maternal sensitivity was difficult to assess in isolation because of the confounding influence of other variables like child temperament, parent temperament, family adversity and stress.

To summarise, the parental caregiving system has been investigated in relationship to attachment security. Certain behaviours which are associated with insecurity in children and adults are also observed in the parents of insecure children (e.g., insensitivity to others' needs; Koren-Karie et al., 2002). Although parental sensitivity appears to be modestly related to attachment security (see meta-analysis of deWolff & van IJzendoorn, 1997) and hence may be a protection for distress disorder development, more

parenting and family characteristics have been found to be involved in emotional outcomes for children. Research has found that those behaviours which seem most prominent are those of intrusive overprotection and rejection (Barber, Bean & Erikson, 2002; Grüner et al., 1999; Markus et al., 2003; Schaefer, 1965; Wolfradt et al., 2003). To this end, the following section broadens the discussion of risk to rejecting and psychologically controlling parenting styles, theorised to be at the opposite ends of the parenting continuum to parental sensitivity (Barber, Bean & Erikson, 2002).

### **8.7. Defining the Parenting Styles related to Distress**

There are many parenting styles named and defined which have been related to distress (e.g., "authoritarianism, child-centeredness, intrusiveness, possessiveness, hostile detachment, strictness, expression of affection and neglect"; Rapee, 1997, p. 48). These many names and definitions have made comparison across studies difficult. Additional problems have arisen as notions of parental control have been combined with other parenting behaviours (e.g., Baumrind, 1991; Steinberg, Lamborn, Dornbusch & Darling, 1992; Steinberg, Mounts, Lamborn & Dornbusch, 1991) producing confounded results (Barber, 2002). Despite limitations, however, there have been some consistent results emerging.

Rapee (1997) reviewed retrospective, self-report and observational studies. He reported that the most consistent child-rearing variables reported in relationship to anxiety and depression are three factors originally described by both Siegelman (1965; Loving, Demanding and Punishment) and Schaefer (1965; Acceptance/Rejection, Psychological Autonomy/ Control and Firm/Lax Control). Similarly, a review by Barber and Harmon (2002) reported two broad categories of parent behaviours as fundamental to child adjustment: parental support, encompassing parental warmth and acceptance, and parental control, consisting of psychological and behavioural

control (e.g., Darling & Steinberg, 1993; Peterson & Hann, 1999; Schaefer, 1965b).

Parent support appears to be the most important factor described in the literature (Rapee, 1997). This factor, described as a unidimensional construct consisting of "warmth, responsiveness, acceptance, attachment" (Barber, 2002, pp. 3) on one pole and lack of support involving rejection and detachment on the other. Parental control appears to have two components: psychological and behavioural control. Psychological control is defined as "covert psychological methods of controlling the child's activities and behaviour that would not permit the child to develop as an individual apart from the parent", Schaefer, 1965b, p. 555) and described with variables like "coercion, induction, guilt induction, love withdrawal,... hostile control, inconsistent control" (Barber, 2002, pp.3). Behavioural control (Schaefer, 1965b) consists of variables like discipline or firm control, monitoring of responsibilities, daily activities, manners and behaviours towards others. Rapee (1997) found behavioural control to be related most inconsistently to distress. Others have found it to be moderately associated with healthy child development (Barber, Olsen & Shagle, 1994; Holmbeck, Shapera & Hommeyer, 2002). This variable will not be substantially elaborated upon here because it is rarely associated with anxiety and depression (Rapee, 1997; for discussion of this construct the reader is referred to Barber, 2002; Pettit & Laird, 2002). Parental support (acceptance vs. rejection) and Psychological control (vs. sensitive parenting) are associated with distress (Rapee, 1997) and generally are referred to by their negatively valenced attributes: rejection and psychological control in the literature.

### **8.7.1. Research related to Rejection, Psychological Control, and Distress Disorders**

Research relating parenting to anxiety and depression in youth can be divided according to the type of research conducted. Following are the research findings from retrospective, cross-sectional, longitudinal and direct observation studies.

#### **8.7.1.1. Early Retrospective Offspring Studies**

Several retrospective self-report studies have found two variables similar to rejection and psychologically controlling parenting to relate to distress disorders (Arbel, & Stravinsky, 1991; Gerlsma, Emmelkamp & Arrindell, 1990; Gotlib, Mount, Cordy & Whiffen, 1988; Parker, 1981). These two principal variables based on the Parent Bonding Instrument (PBI; Parker, Tupling & Brown, 1979) are defined as: perceived warmth and intrusive control in parents, labelled 'care' (a parent's ability to express affection, communicate and elicit closeness) and 'overprotection/control' (the parent's ability to allow independence, respect the child's autonomy and facilitate the child's personal growth). Both have been found to be related to a number of clinical disorders. Patients with agoraphobia (Parker, Tupling and Brown, 1979), depression (Parker, 1979a), Panic Disorder (PD), Generalised Anxiety Disorder (GAD) (Silove, Parker, Hadzi-Pavlovic, Manicavasagar & Blaszyński, 1991) and outpatients with anxiety disorder (Parker, Tupling & Brown, 1979) scored their parents as less caring and more overprotective than controls on these dimensions. Further, the data suggested that parental overprotection may be related more to the aetiology of GAD (Silove et al., 1991). Other studies have linked rejecting and controlling parenting retrospectively to other forms of psychopathology (e.g., borderline personality disorder; Zweig-Frank & Paris, 1991) suggesting these dimensions may extend beyond the distress disorders.

In a nonclinical population sample of mostly Australian participants, retrospective accounts of low parental care and high parental protection (i.e., overprotection) were related to trait depression, low self-esteem and the frequency of depressive episodes in the prior year. By contrast, only high protectiveness was related to trait anxiety (Parker, 1979b). In another nonclinical sample of adults, low maternal care was the strongest predictor of both trait anxiety and trait depression, while maternal protection accounted for additional variance in anxiety scores (Parker, 1979c). Subsequently, Parker (1981) found that anxiety disordered patients reported significantly higher protection and lower care from their parents than matched controls. A later study found low care differentiated young anxiety disordered adults from non-disordered controls (Benoit & Parker, 1994). Still another later study found low care and overprotection to be related to trait anxiety and an external locus of control in a clinical sample of anxious young adults pointing to some variability in findings (Bennett & Stirling, 1998). However, taken together these findings suggest, retrospectively at least, that parenting styles perceived as lacking in warmth (or rejecting) and being overprotective are related to anxiety and depression.

#### **8.7.1.2. Cross-sectional Research**

Clinical and nonclinical child samples have confirmed the relationship between self-rated anxiety and depressive symptoms and overly controlling and rejecting parents (e.g., Chorpita, Albano & Barlow, 1996; Crook, Raskin & Elliot, 1981; Grüner, Muris & Merckelbach, 1999; Messer & Beidel, 1994; Mills & Rubin, 1998). For example, Messer and Beidel (1994) found that 8-11 year old children diagnosed with anxiety disorders reported their families to be more controlling than did children with test anxiety or nonanxious children. Also, a recent cross-sectional study (Markus, Lindhout, Boer, Hoogendijk & Arrindell, 2003) that drew from a general population of children found parental intrusiveness and rejection to be related to trait anxiety (STAIC; Spielberger, 1973) across age-groups (7-13 years).

Similarly, research with a university sample of late adolescents and young adults found an association between parent's psychological controlling behaviours (involving high levels of criticism and guilt induction) and depression and low levels of adolescent self-esteem (Oliver & Paull, 1995).

Another study implicated rejection as important. Reiss et al. (1995) used structured equation analysis to study various parenting variables and their effects on depressive symptoms in adolescents from 708 families. The study found that while rejection (defined as lack of parental warmth-support) was related to adolescent depression symptoms, psychological control was not. However, they did find a lower order factor labelled maternal 'attempts at control' to influence depressive symptoms of the adolescents. Chorpita and Barlow (1998) cautioned that further study was necessary to determine whether this lower order factor was, in fact, akin to the notion of psychological control as already defined. With both behavioural control and psychological control variables mixed together in this study, it also is difficult to interpret the findings (Barber, 2002).

Psychological control also appears to have a negative effect on children of other cultures. Examining the effects of psychological control on preschoolers, Hart, Nelson, Robinson, Olsen and McNeilly-Choque (1998) found that in a sample of Russian children, teacher reports of hostile aggression with peers was correlated with mother reports of psychological control. Additionally, Olsen et al. (2002) found that maternal reports of psychological control were associated with internalising and externalising problems in samples of Chinese, Russian and American preschoolers, thus corroborating cross-culturally the negative effects of this parenting style.

#### **8.7.1.3. Longitudinal Studies**

Two longitudinal studies have established an intergenerational link between negative parenting and distress disorders. Brook, Whiteman and Zheng

(2002), using path analysis, found that a reported lack of warmth (i.e., low communication, support and satisfaction) and the use of controlling parenting methods (i.e., power-assertive discipline) between mothers and their adolescent offspring were associated with psychological problems like anxiety or depressed mood and interpersonal difficulties in the offspring. Later, these offspring had a less affectionate relationship with their own child and these children then were also more prone to behavioural problems. Consistent with this finding, the other longitudinal study found that parent's rejection of their offspring was associated with depressed affect in that offspring which was, in turn, related to the offspring's rejection of their own adolescent and to that adolescent's depressed affect (Whitbeck et al., 1992).

A third longitudinal study observed the antecedents and consequences of psychological control in a large general population sample and found not only more psychological control in families with a history of child disruptive behaviour problems, but also in a significant portion of families when children had no history of behaviour problems (Pettit & Laird, 2002). Specifically, anxious behaviours were found in adolescents whose parents were psychologically controlling when they were children, but here only when children were well-behaved. This finding led Pettit and Laird (2002) to conclude that parents who used psychological control were not necessarily considering the needs of their individual children. Instead, they were proscriptively and perhaps inadvertently, keeping the children dependent on them and maintaining unnecessary control in the relationship even though this didn't appear to be needed to manage their child.

The relationship between psychological control and parenting observed in cross-sectional and longitudinal research findings is further supported by observational studies.

#### **8.7.1.4. Direct Observation**

A few studies have used direct observation of parenting styles with distressed children. However, because of the time and manpower involved in observing and coding responses, sample sizes are often small. An accumulation of such studies is gradually building and yielding consistent results. Observing mother-child dyads with preschool children labelled by their teacher as competent, aggressive and anxious, Dumas, La Freniere and Serketich (1995) conducted a semi-structured game, during which they videotaped and coded for the showing of affect and parental control. Mothers of the anxious children demonstrated more 'aversive control' (defined as attempts to gain compliance, intrusion, punishment and criticism and less responsiveness to the child) than mothers from the other two groups. Interestingly, the anxious children were less compliant than children from the other two groups. The authors suggested that perhaps this parenting style prevents the child from having practice at prosocial behaviours and adaptive coping, subsequently producing a psychological vulnerability to stress in that child. A further study involving this same sample showed that reducing the overinvolvement of the mothers of anxious children increased social competence and slightly reduced withdrawal (LaFreniere & Capuano, 1997).

A number of studies have observed the influence of parents on their anxious children during decision-making tasks (Barrett, Rapee, Dadds & Ryan, 1996; Chorpita, Albano & Barlow, 1996; Siqueland, Kendall & Steinberg, 1996). In one of these studies, independent raters found parents of anxious children to be more psychologically controlling and less warm in their interactions during problem-solving tasks and more endorsing of avoidant solutions than parents from the control families (Siqueland et al., 1996). Their involvement was also observed to increase the child's anxiety. A more recent study that observed children and their parents during a 'real threat' task (giving a short talk) similarly found that parents were prescriptive and

controlling of their anxious children (Cobham, Dadds, & Spence, 1999). The other studies cited have produced similar findings.

In terms of moderating effects, gender has been found to play a role. Krohne and Hock (1991), observed older children (aged 10-13) interacting with their mothers during a difficult cognitive task. They found that mothers of more anxious girls were more controlling than mothers of girls with less anxiety, but this was not true for boys. Developmental features and differences related to child distress levels have also been assessed. Hudson & Rapee (2001) had blind raters observe the mothers of clinically anxious children and nonclinical controls during two complex cognitive tasks. Mothers were instructed to help only when the child was in need. As predicted, mothers of anxious children were more intrusive and more likely to give uncalled-for help. Mothers of anxious children were also more negative than mothers of nonclinical children. Although overall, parental involvement decreased with age, the difference between the levels of involvement of the mothers of anxious and nonclinical children did not vary with age (7-9, 10-11 and 12-15). The difference between maternal negativity for anxious and nonclinical children also remained consistent across age groups, although this construct had less inter-rater reliability. In a further study (Hudson & Rapee, 1998b cited in Rapee, 2001), to determine whether parents of anxious children related differently to that child because of their anxiety disorder, anxious children and a nonclinical sibling were observed individually completing the same task with a parent. Both mothers and fathers were more intrusive and offered more uncalled-for help with their anxious child than they did with their other child, although fathers were less so than mothers. Also, mothers of the anxious children were slightly more intrusive with both of their children compared with mothers of nonanxious children.

Parent-child interactions have also been found to reinforce avoidance and to increase the anxious and depressive responses in children. For example,

Dumas et al. (1995) observed that mothers of anxious preschoolers were more likely to be responsive to their child's avoidant solutions than to their prosocial ones. Rather, they tended to question and prompt the child until the child would suggest an avoidant solution. Siqueland et al. (1996) observed these same phenomena with an older (9-12 years) clinically anxious group of children. This sample of anxious children arrived at more avoidant solutions to ambiguous scenarios after consulting with their parents. This observation was also made by Barrett et al. (1996) in a clinically anxious sample of 7-14 year old Australian children. Further analysis of this sample revealed that parents of anxious children actually appeared to encourage the avoidant responses (Dadds, Barrett, Rapee & Ryan, 1996). While parents of non-clinical children were more likely to listen to and agree with prosocial solutions, parents of anxious children were less likely to listen to prosocial solutions offered by their children. Instead, they would ask questions around risk and caution and contribute avoidant solutions themselves. Parents of depressed children appeared to enhance their children's responses in a slightly different way. Observational studies have found that parents of depressed children attend more to failure and pay less attention to the children's accomplishments and are more disengaged than control parents, mirroring the cognitive style of the depressed person themselves (Cole & Rehm, 1986; Messer & Gross, 1995). Similarly, Sheeber and Sorenson (1998) found that during problem-solving tasks, depressed adolescents (aged 12-19) showed less problem-solving behaviour and both depressed adolescents and their mothers were less helpful and displayed more depressive behaviour.

To summarise, it appears that research from a number of cohorts using different methods has consistently found a relationship between distress disorders and a parenting style described as psychologically controlling and rejecting. Rapee's (1997) review of parenting styles in the development of anxiety and depression concluded that there was a consistent relationship between symptoms of anxiety and depression and perceived parental

psychological control and rejection among retrospective studies, cross-sectional and longitudinal offspring studies and concurrent studies using parent and child self-report and observer ratings. Some studies reviewed have indicated tentatively that parental psychological control may be more specifically related to anxiety and parental rejection more closely related to depression, (although relevant correlations were low,  $r = 0.2$  to  $0.3$ ; Rapee, 1997). Other longitudinal and observational studies have confirmed similar results, although few have made the discrimination between anxiety and depression. Rapee (1997) has suggested that a large amount of variance in depression and anxiety is accounted for by other variables. He suggested that interactions with child temperament and parent psychopathology as well as the possibility of the cyclical relationship between these variables and childrearing patterns may need to be investigated in the future. Similarly, Chorpita and Barlow (1998) furthered this point suggesting that few studies have investigated the role of cognitive processes in relation to parenting behaviour and the development of negative affect. They suggested that more studies are needed to evaluate other constructs related to parenting and distress in order to understand other environmental and cognitive mechanisms which may more fully explain the relationship. This evaluation is particularly pertinent to children in middle childhood.

### **8.8. Parenting in Middle Childhood**

As with the attachment relationship (see Section 7.4.2.), it has been suggested that parental acceptance, psychological control and behavioural control are particularly salient parenting behaviours in middle childhood and during the transition to adolescence (Holmbeck, Shapera & Hommeyer, 2002). Specifically, the developmental changes in cognition, social relationships and multiple contexts associated with middle childhood allow children to take increasingly greater control over their lives (Collins, Harris & Susman, 1995; Maccoby, 1984). Parents who are able to facilitate this increased responsibility while continuing to provide discipline, monitoring

(behavioural control), warmth and affection (e.g., acceptance) seem to facilitate the best adolescent adjustment outcomes (Barber & Harmon, 2002; Maccoby & Martin, 1983; Steinberg, 1990).

### **8.9. Parenting Styles and Perceptions of Control**

Although there are an abundance of studies relating parenting styles to distress disorders, there are not as many relating parenting styles to the cognitive constructs of perceived control and perceived competence considered in this research and purported by Barlow to be more specifically related to distress. Most studies relating parenting and control-related constructs refer to the less specific construct of locus of control (Rotter, 1966) rather than perceived control (Weisz, 1990). The latter is closer to the construct described in Barlow's model (Chorpita & Barlow, 1998) and has demonstrated a closer relationship to anxiety at least in adult studies (Rapee, Craske, Brown & Barlow, 1996). A review of studies relating parental antecedents to locus of control (Carton & Norwicki, 1994) found that children with an internal vs. an external locus of control had parents who were consistently more contingent and sensitive, warm and supportive (similar to parenting dimensions of acceptance and sensitive parenting; Schaefer, 1965). For example, Gordon, Norwicki and Wichern (1981) observed mothers of seven year old children during a difficult puzzle task. Mothers of children who had an internal locus of control were observed to be more rewarding and less critical and observed to show more warmth and more autonomy granting. In another study of parents and ten year olds, parents of internally controlled children were not only more warm and contingent but were also described anecdotally as having a more relaxed family atmosphere filled with fun, and as being more encouraging and less critical (Chandler, Wolf, Cook & Dugovics, 1980). Likewise, the review found that high external locus of control in children was related to parental protectiveness and intrusive governance (e.g., Biocca, 1985; Washington, 1974, both cited in Carton & Nowicki, 1994).

A review by Schneewind (1995) including broader definitions of control beliefs (i.e., self-efficacy, perceived control, perceived competence, locus of control) found similar results. Children with internal control beliefs had parents who were consistently and contingently responsive to their children (e.g., Davis & Phares, 1969; Yates, Kennelly & Cox, 1975); less hostile, more contingent with discipline (e.g., Davis & Phares, 1969); were less intrusive, more granting of autonomy (e.g., Loeb, 1975) and more emotionally supportive and warm (e.g., MacDonald, 1971; Nowicki & Segal, 1974; Yates et al., 1975). A longitudinal study by Schneewind (1995) tested parent and child control beliefs as well as child perceptions of parent child-rearing when children were 9 to 14 and then measured self-efficacy beliefs (i.e., perceived ability to handle difficult, unexpected life problems) when the children were young adults of 25 to 30 years. They found that 16% of the variance in self-efficacy in the males and 12% in the females was predicted by the children's perceptions of their parent's parenting behaviour. However, although correlations between parenting practices and internal control were similar for both sexes when they were young, sons were more self-efficacious when their fathers were supportive, their mothers were task-oriented, appropriately demanding (i.e., non-rejecting), and the parents were in agreement about discipline practices. Daughters were more self-efficacious when their fathers were more demanding of educational and career-focused excellence and mothers were more psychologically influencing (e.g., using appeals for sympathy to get them to comply) though mother's psychological influence was more related to external locus of control when the daughters were children. Schneewind (1995) suggested that perhaps the result reflected a phenomenon particular to German culture where women who were self-efficacious adopted a 'male' attitude which was learned from the relationship with their fathers. No later longitudinal relationships of this kind were found that could confirm whether this result was culturally or possibly cohort-based, as women in western culture, now, have other, more female-oriented models of self-efficacy to follow. From

both reviews, it seems that a combination of parental acceptance or warmth and contingency and parental sensitivity facilitated their children's experiences of control over events in their environment, which, over time contributed to a more generalised sense of control (e.g., Bryant & Trockel, 1976; Carton & Nowicki, 1994; Chorpita & Barlow, 1998).

Chorpita and Barlow (1998) pointed to another study which examined these parental behaviours observationally by comparing two groups of 5-7 year old children on their ability to show mastery vs. helplessness in a difficult puzzle task completed with their mothers (Nolen-Hoeksema, Wolfson, Mumme & Guskin, 1995). Mothers of one group suffered from major depression while mothers of the other group did not. Their results indicated that the children's show of helplessness was not related to their mother's diagnosis of depression per se, but was related to the mother's degree of responsiveness (e.g., acceptance) and their ability to encourage opportunities for the child to gain control over problem-solving (e.g., sensitivity). This suggested to Chorpita and Barlow (1998) that parental acceptance and encouragement for the child to experience control in situations fosters the development of control-related cognitions. That is, it may be that the direct genetic or temperamental "helpless" link is mediated by factors such as parenting styles to increase a sense of control.

Taken together, these results provide a link between the parenting constructs similar to acceptance vs. rejection and parental sensitivity vs. psychological control and perceived control in the child. Chorpita and Barlow (1998) have suggested that theory and research in the area of attachment may be the beginnings of the development of a perception of control as the securely attached child feels accepted, feels safe to explore and first gains the skills they need from their attachment figures to be able to feel in control of other interactions in the world (see also Bowlby, Section 7.4.2.). Further, parenting behaviours observed with securely and insecurely attached infants appear to parallel those behaviours of sensitive versus

psychological controlling parenting and acceptance versus rejection discussed in relationship to control. These same parenting dimensions in reference to attachment relationships have also been related to later distress disorders and adaptive functioning (see section 7.6).

While dyadic relationships between parenting styles and perceived control and between parenting styles and distress have been observed, very seldom have there been studies measuring the three constructs together. The following section reviews that literature.

### **8.10. Parenting Styles, Perceived Control and Distress**

Only three studies were found which investigated the relationship between the three constructs of parenting, control-related beliefs and disorder development. One study used a population of young adults and cross-sectional design to relate a sense of control to parent behaviour in both clinical and nonclinical individuals. Bennet and Stirling (1998) compared anxiety disordered (AD) young adults and nonclinical individuals with high (HTA) and low (LTA) trait anxiety on measures of locus of control and perceived parenting style using the PBI. As expected, there were significant differences among the groups in the areas of overprotection, care and locus of control with the HTA group scoring between the anxiety disordered and LTA groups on all three variables. That is, those who endorsed both high anxiety and high parental control and rejection were also more likely to feel that others had more control over their life than they did.

Another cross-sectional study with families of clinically anxious and non-clinical children in middle childhood used structural modelling to explore the theme of cognitive bias and how a controlling family environment affected the child's sense of perceived control (Chorpita, Brown & Barlow, 1998). In looking at the relationship between the child's locus of control and control within the family environment, they found support for the model that a

child's locus of control mediated the relationship between family control and child negative affective (comprised of measures of anxiety and depression and parent-report of distressed behaviours). Similarly, in another clinical sample of similar age, Stark, Schmidt and Joiner Jr. (1996) found that control-related beliefs mediated the relationship between parental critical messages and depression severity, although it did not find this relationship to exist for anxiety severity. Although these studies did not measure psychological control and perceived control per se, they did make the first step in identifying how the cognitive constructs performed in relationship to parental control and distress development.

As well as studies relating parenting dimensions of control and rejection to perceptions of control and to the development of distress disorders, there are theories and research findings which have related parenting styles to adjustment problems in the child by way of other similar cognitive mechanisms, like self-esteem and self-efficacy. The following section looks at such relationships.

### **8.11. Parental Psychological Control and Rejection as Risk for Healthy Child Development**

Developmental researchers (Baldwin, 1949 cited in Barber, 2002; Baumrind, 1991; Maccoby & Martin, 1983; Schaefer, 1959, cited in Barber, 2002) have consistently found that healthy development in children is associated with a context of high levels of parental warmth and acceptance; encouragement of individuality and parental sensitivity; as well as consistent behavioural control. The first two dimensions have been associated positively with competence and high self-esteem (e.g., Gray & Steinberg, 1999). The latter dimension, behavioural control, has just recently been more clearly defined and has been associated with positive adjustment (e.g., Pettit & Laird, 2002; Steinberg, 1990). A large study of over 8000 adolescents found that high levels of parent acceptance and autonomy-granting were related to feelings

of self-competence and self-confidence in both the social and academic domains and this sense of self-worth seemed to guard against anxious and depressive feelings (Gray & Steinberg, 1999). Low levels of both acceptance and autonomy-granting were related to anxiety and depression. Additionally, each protected the adolescent from distress when the other parenting risk factor was present. That is, experiences of psychological autonomy protected against distress when parent acceptance was low and parent warmth and care protected against a psychologically controlling parenting style.

A review by Barber and Harmon's (2002) also suggests that psychological control and rejection affect the development of autonomy/independence, self-confidence and perceived control in children. Psychological control and rejection have been associated with negative psychosocial adjustment, especially low self-esteem (Barber, 1996, Barber & Harmon, 2002; Gray & Steinberg, 1999; Steinberg, 1990); self-worth (Garber, Robinson & Valentiner, 1997) and self-confidence (Conger, Conger & Scaramella, 1997). Psychological control has been demonstrated to intrude on differentiation from parents (Allen, Hauser, Bell & O'Connor, 1994; Armsden & Greenberg, 1987; Barber, 1992; Barnes & Olsen, 1985; Garber, Robinson & Valentiner, 1997), psychological competence and self-direction (Steinberg, 1990), and identity and efficacy (Barber, 1997; Baron & MacGillivray, 1989). Barber and Harmon (2002) interpreted this research overall to suggest that the parent who is psychologically controlling is not taking a neutral position in socialisation of the child for the child's benefit but imposing controls, perhaps unwittingly, that protect the parent's position in the family.

However, it seems that both child temperament and parent personality have a role to play in parental and child behaviours in combination with control-related perceptions. Morris, Steinberg, Sessa, Avenevoli, Silk and Essex (2002) found in a sample of six to nine year old children that it was maternal psychological controlling combined with a child's negatively reactive

temperament (defined as the tendency for the child to react to stress with high degrees of emotional lability in the form of fear, sadness, irritability or anger; Rothbart & Ahadi, 1994) that predicted child emotional problems. Further, while maternal criticism was associated with Behavioural Inhibition and emotional overinvolvement was associated with separation anxiety in a sample of at-risk 4 to 10 year old children (Hirschfeld, Biederman, Brody, Faraone & Rosenbaum, 1997a), Behaviourally Inhibited children, whose mothers were critical but did not suffer from an anxiety disorder did not display distress behaviours in her presence (Hirschfeld et al, 1997b).

This study also found that a lifetime history of maternal anxiety disorders was independently associated with maternal criticism, suggesting the possibility of criticism being a part of an anxious mother's parenting style. Also, the correlation between maternal criticism and family cohesion was close to significant suggesting that parental anxiety and criticism may affect the atmosphere of the whole family.

Equally, it may be that the mother's interactions with the child make her more prone to react negatively. Rubin and Mills (1991) found that mothers of withdrawn-internalising children were more angry, disappointed, embarrassed and guilty about displays of withdrawal and aggression from their children than were control mothers. They also tended to be more directive in their teaching of skills and overcontrolling in their reactions, alternatively blaming themselves and a trait in the child for the child's shortcomings. Rubin and Mills (1991) concluded from these findings that the withdrawn child experienced a complex array of conflicting emotions from their mothers that very well could contribute to a sustained sense of uncontrollability. Dadds and Barrett (1996) have furthered this idea suggesting that a combination of attachment theory and the 'coercive operant model' of parenting first discussed in relationship to aggression in families (Patterson, 1982) can provide further explanatory power for understanding the interaction between parents and anxious children. This

combination suggests that emotionally vulnerable and/or insecurely attached children who incessantly seek closeness and reassurance from their parents can often be rejected by a parent whose toleration levels have been exceeded. This then reinforces the child's fearfulness and need to redouble their efforts to maintain closeness; which forces the parent to acquiesce (e.g., Dumas et al., 1995). This leads to an ever-increasing cycle of fearful demanding and rejection and acquiescence that does not result in either a sense of control or social skill acquisition (Dadds & Roth, 2001).

### **8.12. Chapter Summary**

It seems clear that the parenting styles of psychological control and rejection and alternatively, parental sensitivity and acceptance are related to vulnerability and protection for the child. These parenting styles appear to have associations with maternal anxiety, criticism, and the child's temperamental vulnerability as well as with attachment security, control-related perceptions and distress (e.g., Nachmias, Gunnar, Mangelsdorf, Parritz & Buss, 1996). These combined results make a strong case for the influence of parenting styles within a multifactor model of distress aetiology. The question remains as to whether there are more general family conditions that contribute to this influence. The following chapter addresses this question.

## **CHAPTER 9.**

### **FAMILY FACTORS RELATED TO VULNERABILITY FOR DISTRESS**

#### **9.1. Chapter Overview**

This chapter looks more closely at theory and research related to the family constructs that have been associated with the development of anxiety or depression and with the development of perceived control and competence in the child. First, there is a brief review of how family systems support distress development. Next, is a discussion of how family systems components are seen, first theoretically and then empirically, to impact on the child in relationship to distress disorder development and perceptions of control. For the purpose of the present study, the family is defined as a system of people that includes a parent subsystem that has the responsibility to care for one or more children.

#### **9.2. Transmission of Distress within Families**

While there is no doubt that parents and parenting styles greatly influence child and adolescent well-being, systems theory suggests that child development is influenced by the broader context of the family environment (Dadds & Roth, 2001; de Ross, Marrinan, Schattner & Gullone, 1999; Jacobwitz & Bush, 1996). For example, a review by Kaslow, Gray-Deering and Racusin (1994) showed that children's self-reported levels of psychological well-being were related to their perceptions of their family environment. Barlow (2002) contends that anything that happened within the family to reduce a child's sense of control would affect how that child thought about themselves and then provide greater risk for the development of distress disorders. He suggested that as these control beliefs are based on an accumulation of perceptions gained from individual events, an early

family environment which provides safety, predictability, consistent affirmation and opportunities to grow is optimal.

Over the past few decades, there has been an increasing emphasis on research concerning the impact of interpersonal systems (e.g., the family, couples and the larger community) on child development. It has become clear that the early development of distress problems is linked to general distress within the family “through mechanisms like inherited temperament, learning that emphasises threat and avoidance and high parental control and low levels of secure attachment” (Dadds & Roth, 2001, pp. 278). While there is a lot of empirical evidence supporting the indirect genetic transmission of distress (i.e., anxious parents with anxious children, Eley, 2001; Chapter 5) and child distress being affected by attachment security, parental control and rejection (see Chapter 7, 8); there is mixed empirical support for the effect of general family systems on distress disorder development.

Indirect evidence that the family environment affects anxiety-prone children has come from behavioural genetics research. This research has shown that shared environment (i.e., the family) has a significant influence on a child living in it, making way for aetiological models of distress disorder development to include family influence (Dadds & Roth, 2001). While theory and individual case evidence support the role of systemic aspects within the family providing risk for the development of distress, there are few multi-variable studies which can empirically support the conjecture (Dadds, 1995). For example, while conventional wisdom would suggest that family aspects which discourage independence (e.g., enmeshment) or make it emotionally unsafe (e.g., conflict) could also be related to both a sense of control and anxiety and depression, little research has assessed these linkages. Dadds and Roth (2001) suggest that perhaps a problem could lie with the particular difficulty in measuring systemic factors in comparison with individual or

dyadic factors, an issue addressed later (Section 9.6). First, it is important to explore the research that is available.

Different family conditions have been found to intrude upon the psychological independence of its members (Barber, Bean & Erikson (2002). Family systems and process literature, mostly as a result of clinical observation, have found constructs such as overprotectiveness, enmeshment (Colapinto, 1991; Minuchin, 1974; Minuchin, Rossman & Baker, 1978); distance, separation, disengagement (Minuchin, Rossman & Baker, 1978; Boszormenyi-Nagy, Grunebaum & Ulrick, 1991); rigid or diffuse family/subsystem boundaries, double bind communications (Bateson, Jackson, Haley & Weakland, 1956; Minuchin, Rossman & Baker, 1978; Satir, 1967) to be involved. These systemic family features include blurred boundaries between members, demands for loyalty at the expense of personal autonomy and the exaggerated emphasis on protection, with a very narrow view of self (Colapinto, 1991). These features have had considerable theoretical and anecdotal support but have received mixed empirical backing especially in relationship to anxiety disorders (Dadds & Roth, 2001; Fauber & Long, 1991). Before discussing the measurement of these constructs and the pertinent research in more detail, it would be appropriate first to explore how theory has viewed the family and then describe the impact the family has on children, particularly in their middle childhood years.

### **9.3. Family Models and their History**

It has long been accepted that for most children the family is the first sustained learning environment in which many of the ways children learn to interact with the world are acquired. The concept that social problems are linked to family functioning and can be modified by attending to the needs of the family in society has been considered a truism since at least the eighteenth century (Thomas & Wilcox, 1987). It is interesting therefore that it has not been until the middle of the twentieth century that there has been

systematic consideration of the role the family may play in the development and maintenance of distress and mental illness of its members. In the 1930's and 1940's, the Marriage Guidance Movement was including couples in therapy and child guidance centres were discovering the expedience and remediation value of adding therapy with the parents to therapy with the child. However, it took until the 1950's for therapists to begin to see the family as a whole (Kaslow, Green-Deering & Racusin, 1994). It was then that family models of schizophrenia emerged in both the United States (Bateson, Jackson, Haley & Weakland, 1956) and Britain (Laing, 1961).

Other case-study-based models emerged where psychopathology was viewed within the context of the family system. The psychoanalytic family model, initiated by Ackerman (1958), looked at family interaction patterns as an outward manifestation of unresolved intrapersonal conflicts and looked at how to identify and resolve these. The structural family model (Minuchin, 1974) worked with family rules (i.e., universal and individual) and subsystems (e.g., parents, parent/child) to alter a dysfunctional family system. Systemic family therapy models including communications and strategic models (Haley & Hoffman, 1967; Satir, 1967; Selvini-Palazzoli, Boscolo, Cecchin & Prata, 1978) were similar to the structural model in the belief in the interdependence among the members, with the family as a whole being more than the sum of its parts. While each had different methods of working with the family, a number of constructs including family cohesion (i.e., shared affection, helpfulness, support and care among family members; Moos & Moos, 1981); enmeshment (i.e., family members' demand for psychological and emotional togetherness at the expense of individual pursuits; Bloom & McNaar, 1994); conflict (i.e., fighting, criticism, anger expressed in the family, Bloom & McNaar, 1994); democratic family style (i.e., how often family decisions are made with all participating, Bloom & McNaar, 1994); family sociability (i.e., how much members engage in and enjoy social interactions with others, Bloom & McNaar, 1994) and authoritarianism (i.e., how much parents make rules concerning family

behaviour, expect compliance and punish when rules are broken, Bloom & McNaar, 1994) were largely applicable to most models.

On the other hand, the behavioural family movement was closely linked to behaviour modification and was influenced by Bronfenbrenner's (1977) experimental ecological approach to developmental psychology. With this approach emphasising parent-child interaction, parent training became an integral part. The model grew to include emphases on how patterns of parent-child interactions are related to the broader family (i.e., marital system, social support, family communication; Sanders & Dadds, 1993). Because of the focus on empirically evaluating hypotheses and methods and an emphasis on working with dyads, it was said to be more able to be scientifically researched (Dadds, 1995). The difficulty as it relates to causal mechanisms or correlates was that generally the research emphasis was on effectiveness of parent training. Hence as mentioned, the majority of this type of research related parenting factors and not more systemic aspects of the family to anxiety and depression (Dadds & Roth, 2001).

#### **9.4. The Nature of the Family**

Despite the differing models and lack of clear research evidence to confirm it, family therapy literature has been consistent as to what constitutes a functional family system over time. Bronfenbrenner (1979) described the family as "the most powerful structure known for nurturing the capacity of human beings to function effectively in all domains of human activity--intellectual, social, emotional and physiological" (p.6). Bronfenbrenner's (1979) ecological model saw the family as embedded within other overarching systems of influence which impacted on the family without the family necessarily having directly experienced events from these systems (e.g., political, economic). Minuchin (1974) saw a functional family as having semi-permeable boundaries between subsystems and rules which were consistent yet flexible enough to adapt to change from within or to

weather assault from outside. Virginia Satir (1967), used a systems theory and communications theory base (see Watzlawick, Beavin & Jackson, 1967) and saw the family as a constantly growing, integrated system comprised of a number of sub-systems, with each member of the family performing multiple roles, whether overt or covert, within each sub-system. She maintained that healthy growth would be promoted in an 'open family system' that allowed members to: have and share different feelings or differences of opinion; and negotiate compromise without destroying the family, themselves or others within it. On the other hand, she believed that there would be multiple risks for family members living in a 'closed system' that limited growth and required consensus for the system to survive a difference of opinion. This kind of family often required one or more member to "be dead to themselves" (Satir, 1967, p.185) in order to survive in the system. Generally, from this view, emotional distress or behavioural disturbance would be likely to be evident in at least one of its members. Satir (1967), whose emphasis was on effective communication patterns, suggested that a child gained self-esteem from being validated in a developmentally appropriate way and from being sensitively socialised within the family to understand how to balance their needs against those of others and the context. She believed that "the individual [had] myriad potentialities and contingency possibilities" and was only hampered by "prohibitions and sanctions preventing self-exploration and change".... with an individual's limited self-image coming... "from a limited context that prevent[ed] growth" (pp.179). This view is congruent with both attachment theory and the parenting literature and reflects Barlow's contention that the family is the first place where multiple experiences of feeling in control accumulate to protect even a biologically vulnerable child from developing a distress disorder (see Sections 8.2.).

### **9.5. Middle Childhood Children as being more affected by Family Dynamics**

The family environment potentially provides particular risk for those in middle childhood as they have become aware of what may be dysfunctional in their family, but are not yet able to avoid the consequences in the same way adolescents are able. Maccoby and Martin (1983) observed that children in middle childhood were more likely to experience the effects of a dysfunctional family system more acutely than children at other developmental stages (see also Section 7.4.2. & 8.8.). They reasoned that during middle childhood, parent-child relationships are developmentally "coregulated" with parents required to look for new ways of monitoring the child's behaviours and guiding their experiences. At the same time, the child is looking for new ways to negotiate freedom within and outside the family. They suggested that this period of adjustment is different from early childhood when children are "parent-regulated" with little understanding of choice; and adolescence when they are more "self-regulated" and have more access to peer support to buffer family experiences.

In terms of research, Smets and Hartup (1988) studied self-reported family functioning and personal adjustment using 120 clinic referred children (sixty—6-11 years) and adolescents (sixty—12-16 years) and matched controls. They found that, overall, the more symptoms the children displayed, the more extreme on the cohesion (enmeshed or disengaged) and adaptability (chaotic or inflexible) dimensions of family functioning (Olson, Russell & Sprenkle, 1979) and the lower the scores for self-esteem and perceived competence they reported. However, when assessing the samples separately, the relationship between family functioning and symptom severity only applied to the younger group (see also Maccoby & Martin, 1983). This suggests that adolescents may be developmentally less affected by their family environment. Supporting this premise indirectly, it was found

that children who coped with parental conflict by distancing themselves from parents and activating social support had greater levels of adjustment than did children who were not able to extract themselves from the parental conflict (O'Brien, Margolin & John, 1995). Longitudinal evidence has lent additional weight to the argument. Williams, Anderson, McGee and Silva (1990) found that low levels of cohesiveness and the inability to express opinions and feelings within the family, along with high levels of family conflict, were associated with childhood anxiety and depression at age 11. These disorders were not linked with family factors in adolescence (13 and 15 years) or earlier (7 years) suggesting, again, that middle childhood is a particularly vulnerable time for family risk factors to affect the development of anxiety and depression.

## **9.6. Measuring Perceptions of General Family Functions**

There are few valid and reliable measures of general family function being used at present (Fauber & Long, 1991). There appear to be several reasons for this. Fauber and Long (1991) found that there were many measures, but universality was compromised because most were constructed to address a specific research question. Barber and Buehler (1996) asserted that limited cross-discipline flow between researchers hampered progress in the family field. For example, they found little coordination between the research done by family clinicians operating at a family systems level and psychologists and sociologists typically focusing on patterns of dyadic interaction among specific family members, despite some considerable overlap in hypotheses. Additionally, the covert nature of the constructs involved and the complexity of family interactions appear to make the measuring of family environmental components particularly difficult. Bloom (1996) asserted that difficulties arose because most domains of family function were correlated. While supporting the idea of direct observation in some cases, he stated that self-report was necessary to assess perceptions of an individual's family and to augment information derived from measures of parenting styles. He

believed that, especially in the child and adolescent mental health field, data from more than one family member was also useful to get multiple perspectives.

Two studies (Bloom, 1985; Bloom & Naar, 1994) factor analysed four self-report measures of general family function: Family Environment Scale (FES; Moos & Moos, 1981); Family Concept Q Sort (FCQS; van der Veen, 1965); Family Adaptability and Cohesion Evaluation Scales (FACES; Olson, Bell & Portner, 1978) and the Family Assessment Measure (Skinner, Steinhauer & Portner, 1978) in order to find a comprehensive, reliable and valid way of describing families. Called the Self-report Measure of Family Functioning (SRMFF), Bloom (1985) initially identified 15 aspects of family functioning. However, because these factors were significantly correlated with one another, additional analyses (Bloom & McNaar, 1994) yielded three distinct second-order factors. Each factor reflected a number of components within family functioning. Factor one reflected within-family functioning (positive cohesion, expressiveness, valuing of members, democratic decision-making and negative conflict and disengagement). Factor two reflected how the family related to the world (positive sociability, intellectual/cultural, active recreation and negative enmeshment and family external locus of control). Factor three reflected family constriction and organisation (positive organisation including neatness, promptness, religious emphasis and authoritarian family and negative disengagement and 'ruleless' permissive family style; Bloom & McNaar, 1994). Further analysis found that two pairs of variables within the first factor had equivalently high factor loadings (family valuing versus cohesion, expressiveness versus democratic family decision-making, respectively) suggesting to the authors that only one of each pair was needed to assess perceived family functioning in that area.

### **9.7. Research Using This Measure and Related Constructs**

As mentioned, research in the area of general family functioning is limited and often appears to have conflicting findings except when very broadly applied. Beavers, Hampson and Hulgus (1985) found that Bloom's variables relating to within- and extra-family functions (SRMFF, 1985; Bloom & McNaar, 1994) were correlated with overall family health on their Self-Report Family Inventory. Shean and Lease (1991) who administered items from the cohesion and enmeshment subscales of the SRMFF to a college sample, found that scores on the enmeshment subscale were significantly positively correlated with a predisposition to agoraphobic anxiety. Longitudinal evidence from a New Zealand cohort born in 1972-1973 more directly linked family environment dimensions to later child adjustment. A family relations index comprising three dimensions of one of the measures factor analysed by Bloom and McNaar (1994): family cohesion, expressiveness and conflict (Moos & Moos, 1981) was administered to mothers when their children were 7, 9, 13 and 15 years. Multiple disorders were found in 11 year old children whose mothers had earlier reported low levels of family cohesion and expressiveness (e.g., democratic decision-making; Bloom & McNaar, 1994) and high levels of family conflict (McGee, Feehan, Williams, Partridge, Silva & Kelly, 1990). When the same children were 15, mothers who confirmed the presence of emotional disorders in their children also reported past and current low levels of family cohesion and expressiveness and high levels of conflict (McGee et al., 1990).

Stark, Humphrey, Crook and Lewis (1990) administered a child version of the SRMFF to 51 school children aged 9 to 14, of whom 41 were classified with anxiety, depression or comorbid anxiety/depression and 10 of whom were non-clinical controls. They found that self-report ratings of the three diagnosed groups of children differed significantly from the ratings of the control group. The three diagnosed groups assessed their families as being less cohesive, less democratic in decision-making, less social and

participating in fewer outside activities than the control group. They also saw themselves as being more enmeshed and having more family conflict. Based on the children's perceptions, these factors together accounted for almost 90% of the variance between the diagnosed and control groups. As expected, the most symptomatic group (the comorbid anxious/depressed group) reported most dysfunction in these family areas with the anxious group the least affected amongst the disordered groups. From these findings, the authors suggested that depressed and, to a lesser degree, anxious children may see themselves as having less say in decisions that affect them and therefore have perceptions that they are unable to control life around them. These perceptions may then lead to a sense of helplessness (Seligman et al., 1984). Another consequence of not participating in decision-making in the family could be the lack of practice at this skill which could lead to a deficit in general problem-solving ability (Nezu, Nezu, Saraydarian, Kalmar & Rosan, 1986). An interesting finding from the Stark et al. (1990) study was that mothers of anxious children saw their families in a more positive light than did mothers of the controls, leaving Stark, Humphrey, Laurent, Livingston and Christopher (1993) to wonder whether an unrealistic maternal perception contributes to a child's 'out of control' feeling.

These findings about a family environment perceived by the child as affording less opportunity to feel close in the family, less opportunity to make their own decisions and less ability to see how others interacted (i.e., sociability) must be explored in the light of the literature related to perceived control. It may be, as mentioned by Bowlby and Barlow, that cognitive schemata about self-worth are formed as a result of not feeling in control in the family. It may be that the less functional perceptions of family reported by the more symptomatic, depressed children could also be a reflection of a more severe cognitive bias in these schemata. Addressing this latter issue, Stark, Humphrey, Laurent, Livingston and Christopher (1993), compared the cognitions of anxious and depressed children and found that depressed

children reported more negative views about themselves, the world and the future in the form of more declarative statements while anxious children reported the same frequency of cognitions in the form of questions. More research is needed to corroborate this finding. If this were the case, however, it would lend weight to Bowlby's and Barlow's proposition that early experiences and communication in the family may lay the foundation for the development of core schemata that organise children's information processing. In the case of depressed and anxious children, these messages may consist of negative self-evaluations formed from experiences within a conflicted or unsupported environment.

A measure included in Bloom's factor analysis, FACES (Olson et al., 1978) has also been used in studies in this area. Despite the fact that a number of researchers have questioned the theoretical continuum upon which this measure and theory is based (i.e., enmeshment vs. disengagement and chaos vs. rigidity e.g., Barber & Buehler, 1996; Farrell & Barnes, 1993), this measure has been extensively used. For example, research has found that families of children referred to a clinic for behaviour problems are more likely than controls to score outside the normal range in the two dimensions, cohesion and adaptability (Portner, 1980, cited in Smets & Hartup, 1988). Additionally, following divorce, enmeshment was a significant predictor of anxiety and depression problems in children between 6 and 16 whose mothers were heads of the family (Johnson, 1982, cited in Smets & Hartup, 1988). Equally, 12-14 year old children diagnosed with distress disorders were significantly more likely to report enmeshment in their families compared to nonclinical controls (Nilzon & Palméus, 1997). These clinically distressed children were also less happy, less confident in their problem-solving ability and more often had overprotective parents than controls. Another study reported mixed findings. Barrett, Dadds & Rapee (1996) found families of children who were about to receive treatment for anxiety functioned no differently on the dimensions of Adaptability and Cohesion compared with nonanxious controls. This suggested to Dadds and Roth

(2001) that problems with general family functioning may not be related to anxious children. However, research using other measures which assess individual constructs has indicated a relationship between family functioning and both anxiety and depression, although the relationship to anxiety is less strong.

## **9.8. Individual Family Environment Constructs and Adaptability or Psychopathology**

Studies have often examined these constructs either individually or in dyads.

### **9.8.1. Family Cohesion alone and in Combination with Conflict as Risk**

An individual construct which has been related to cohesion is enmeshment (Stark, Humphrey, Crook & Lewis, 1990). Despite earlier theoretical conceptualisations as discussed in the previous section (e.g., Olson, Russell & Sprenkle, 1979), enmeshment is now considered to be a separate construct from cohesion (Barber & Buehler, 1996). Cohesion is considered now to be adaptive and is defined as supportive interactions within the family including shared affection, helpfulness, support and care among family members (Moos & Moos, 1981). Using measures assessing this apparently more adaptive function, cohesion in the family has indeed been consistently reported as inversely correlated to adolescent depression (Allen, Hauser, Eickholt, Bell & O'Connor, 1994; Pike, McGuire, Hetherington, Reiss & Plomin, 1996; Sheeber, Hope, Alpert, Davis & Andrews, 1997; Sheeber & Sorensen, 1998). For example, depressed children rated their family environments as less cohesive, with poorer communication and less support compared to non-depressed children (Garber, Robinson & Valentiner, 1997; McFarlane, Bellissimo & Norman, 1995). De Ross, Marrinan, Schattner and Gullone (1999), studied the relationship between perceived family environment factors and the psychological well-being of a small nonclinical

sample of adolescents (aged 10-17). They found that adolescent reports of depression were negatively related to their report of family cohesion and positively related to perceived conflict and psychological control in the family. Their reports of self-esteem were positively related to reports of family cohesion and inversely related to conflict in the family. A relationship between self-reports of low cohesion and high conflict was also found in a sample of young psychiatric inpatients (aged 7-13 years). These two variables were able to discriminate, with 88% accuracy, those who had suicidal thoughts and attempts from those who did not (Asarnow, 1992; Asarnow & Carlson, 1988).

### **9.8.2. Family Enmeshment as a Risk Factor**

Contrasting with cohesion, enmeshment has been described as a violation of the psychological independence of family members or “blurring individual psychological boundaries in favour of a family identity” (Barber, 2002, pp. 24). Early systems theorists have related internalising problems like anxiety and depression to enmeshment and rigidity (Colapinto, 1991; Minuchin, Rossman & Baker, 1978); and “consensus sensitivity” (a combination of enmeshment and lack of democratic decision-making including the use of family rules demanding closeness and agreement, Reiss, 1971). Barber and Buehler (1996) found that child-reported enmeshment in the family was related to higher child-reports of anxiety, depression and withdrawal in a general population of adolescents (mean age 13.7 years). These relations were stronger than those found based on cohesion (i.e., low cohesion). These and parallel findings (e.g., Barber, Olsen & Shagle, 1994) led Barber, Bean and Erickson (2002) to suggest that enmeshment may be the “family-system-level analogue” for a psychologically controlling parenting style since it encompasses behaviours which limit the child’s individuation and sense of control by forcing dependence and mutuality.

### **9.8.3. Family Conflict as a Risk Factor**

Family Conflict as a construct individually related to anxiety has received mixed support. Laraia, Stuart, Frye and Lydiard (1994) found family conflict, assessed retrospectively, to be a significant risk factor for women diagnosed with panic disorder with agoraphobia. Dadds and Powell (1991) also found that marital conflict was a correlate of childhood anxiety in a non-clinical population while Dadds, Barrett, Rapee and Ryan (1996) reported no difference between a clinical sample of anxious children and controls on the frequency of observed aggressive or threat interpretations related to hypothetical scenarios. Bernstein and Borchardt (1996) also reported normal family function in a sample of anxious school refusers. Likewise, Fendrich, Warner and Weissman (1990) found no association between family conflict and anxiety in a sample of anxiety disordered children. However, there was an association found between conflict and depression. They found that in this sample of 6-23 year olds, the presence of parental conflict rated by participants created 18 times more risk for a diagnosis of depression among these offspring of nondepressed parents (Fendrich et al., 1990). Conflict has also been reported to be more consistently associated with depression in young adolescents (Greenberger & Chen, 1996) with depressive thought patterns and low self-esteem being associated with a family environment reportedly high in conflict (Ge, Conger, Lorenz, Shanahan & Elder Jr., 1995; Garber et al., 1997) and high in rejection, hostility and chaos (Dadds, Sanders, Morrison & Rebgetz, 1992; Demo & Acock, 1996; Garber, Robinson & Valentiner, 1997). For example, a one year longitudinal study measuring perceptions of family conflict and support in a community sample of adolescents found that a greater number of concurrent and prospective depressive symptoms were associated with more family conflict and less family support (Sheeber, Hops, Alpert, Davis & Andrews, 1997). The researchers found that both family conflict and support were stable over the year, suggesting changes in adolescent depressive symptomatology did not affect the family environment though

the reverse held true. This result was similar to that obtained using only adolescent self-report data (Hops, Lewinsohn, Andrews & Roberts, 1990) where the adolescents' negative perceptions of family environment factors (of which conflict and support were two of a range of family variables assessed) were associated with higher levels of depressive symptoms.

The link between marital conflict and child behaviour problems has been more recently clarified (Fincham, 1994). Overt conflict as opposed to general marital dissatisfaction was strongly linked to child adjustment difficulties (Coiro & Emery, 1998). For example, mutually hostile interaction patterns between parents when children were 5 predicted externalising behaviours when the children were 8, while withdrawn and angry behaviour of the father predicted later internalising problems in the 8 year olds (Katz & Gottman, 1993). Also, physical aggression between parents appears to have a significant effect on children. During a parent conflict in the laboratory, Gordis, Margolis and John (1997) observed greater anxious, withdrawn and distracting behaviour in 9-13 year old boys whose parents had been physically aggressive over the past year than in those boys who witnessed non-physical hostility or parent/child hostility. Finally, as found with other family variables, the child's perception of the meaning of parental conflict and the child's subsequent coping strategies have been found to affect the child's adjustment (Davies & Cummings, 1994; Grych & Fincham, 1990). In studies where children were old enough to make meaning from parental conflict, verbal conflict that was unresolved and was directly related to the child had more negative impact on the child than did unrelated conflict that was constructively resolved without aggression (Fincham, Grych & Osborne, 1994). Davies and Cummings (1994) concluded that the emotional consequences for the child are determined in part by how they see the conflict impacting on them. For example, O'Brien, Margolin and John (1995) found that children who coped with parental conflict by distancing themselves from parents and activating social support had greater levels of adjustment than did children who involved themselves in the parental

conflict, a finding that can be related to the perception of control. If a child feels in control of what is happening to them (i.e., they are able to remove themselves from the distress), conflict may have less impact. In support of this, Acock and Demo (1999) found that experiences of parent-child conflict were far stronger influences on child adjustment than was interparental conflict. However, when conflicts are resolved or handled constructively, they are also less likely to have a negative impact on the child (Easterbrooks, Cummings & Emde, 1994). Rather, Cummings and Wilson (1999) suggested that conflict constructively resolved in the family accustomed children to the process of learning adaptive ways to resolve interpersonal difficulties of their own.

#### **9.8.4. Family Sociability as Risk**

Family Sociability is an indicator of family social involvement that has been associated generally with child adjustment. It involves the family's orientation to and enjoyment of social activities outside the home and their access to social support. For example, Puig-Antich et al. (1985) found that families of more severely depressed children engaged in fewer recreational activities outside of the family. Conversely, a family environment with "greater variety of common recreational activities, higher cultural orientation, more social contacts with nonfamily members" (Schneewind, 1995, pp. 126) was associated with emotionally supportive and sensitive parenting and an internal locus of control in children (Bradley & Caldwell, 1979; Nowicki & Schneewind, 1982).

Family sociability appears to be of particular importance in disadvantaged communities. A review by McLoyd (1990) found social support networks helped to reduce stress in families suffering from economical hardship by offering cooperative childcare, information and role-modelling. With neighbourhood poverty being associated with less maternal warmth and responsiveness and worse home environments for children (Klebanov,

Brooks-Gunn & Duncan, 1994), support may be particularly important in these communities.

Social support would possibly enhance relationships within the family and perhaps reduce the amount of conflict. Evidence for this possibility has come from research findings that depressed or psychologically distressed African American mothers who had been on welfare spanked their children less frequently after they were supported to find employment (Jackson, Gyamfi, Brooks-Gunn & Blake, 1998). A number of studies conducted with white and ethnic minority families in the U.S. found that consistent parental support and discipline mediated the effects of a number of risk factors (e.g., economic hardship, interparental conflict, maternal depression) affecting child and adolescent adjustment (Dumka, Roosa & Jackson, 1997; Luster & McAdoo, 1991; McLoyd, 1990). Because of its apparent protective function social support may be, for some, a critical factor in reducing risk for distress disorder development.

### **9.9. Family Systems and Cultural Interpretation**

Care should be taken when assessing general family factors in non-white cultures. A number of minority groups structure their families around egalitarian family dynamics rather than the individualism more prevalent in White families (e.g., African-Americans, Asians, Māori). These cultures tend to value cooperation, sharing, reciprocity, obligation and interdependence over individualism, competition, independence, self-development and self-satisfaction (Alwin, 1990; Harrison, Wilson, Pine, Chan & Buriel, 1990). As different cultures use different parenting practices and family processes which reflect their particular values, there is a potential for erroneous conclusions to be made. For example, Asian children are taught to value and comply with family authority to the point of giving away personal interests and desires. Parents typically maintain control over their children's friendships, choice of clothes and outside activities through their adolescent

years (Ishii-Kuntz, 2000). From a White perspective, this would be mistakenly seen as enmeshment and anxious-ambivalent attachment. Caution is therefore necessary when drawing conclusions about risk when cultural diversity is involved.

### **9.10. Chapter Summary and Conclusion**

As has been discussed in this chapter and in a number of other chapters, different types of risk accumulate to make it difficult for a child to feel in control with the more likely possibility of anxiety or depression ensuing. From the studies reviewed in this chapter, it seems that although there are mixed findings, an accumulation of adversity does appear to make a difference. As families are constantly changing complicated systems (Satir, 1967), any change in the factors that influence the family has the potential to influence child outcomes unless relationships within the family are stable. Both Bowlby's and Barlow's theories contend that the family and the parents within it is the place where growth begins, where relationships are formed and where the child gets the messages that will guide them throughout life.

There is no doubt from the research to date, that family relationships and family systems are important for optimal development of children. Evidence is universal from across diverse cultural backgrounds that parents' emotional well-being, positive interparental relationships and consistent parental support, sensitivity and discipline allow children to function often despite poverty, family disruption and difficult life circumstances (e.g., Demo & Cox, 2000; Werner, 1990, 1993). Conversely, parental psychological control and rejection and a family environment high in conflict and enmeshment and low in ways of connecting with each other and the outside world (cohesion, sociability, external support) are vulnerable to poor adjustment (e.g., Demo & Cox, 2000; Werner, 1990, 1993). Without a sense of stability or predictability in the family and without having learned skills or gaining

access to stability from the outside world, a child may be likely to experience adjustment difficulties in the form of distress disorders (Barlow, 2002).

But what of those who experience adverse environmental situations and appear to suffer no ill effects? Steinberg and Avenevoli (2000) state that the only definite conclusions that can be drawn from studies of the relationship between various contexts and psychopathology are that: “bad things have bad effects among some—but not all—people, some—but not all—of the time” (p. 66). Perhaps cognitive perceptions make the difference when all other factors are equal. The following chapter explores how a child’s sense of control or perception of competence may have an effect on the relationships between biological vulnerability, psychological and environmental vulnerability and psychological outcomes.

## **CHAPTER 10.**

### **PERCEIVED CONTROL AS A CENTRAL COGNITIVE CONSTRUCT IN THE DEVELOPMENT OF DISTRESS DISORDERS**

#### **10.1 Chapter Overview**

This chapter explores the construct of perceived control and its place in the development of distress symptoms in children. First, the role of perceived control is discussed in relation to biological and environmental vulnerability and then more specifically in relation to Barlow's aetiological model of distress disorder development. Next, there is an expanded discussion on the constructs including the control construct and an examination of theories associated with perceptions of control and the related construct of perceived competence. These theories are then followed by related research. A description of how the cognitive constructs may mediate or moderate the relation between adversity and distress is then followed by a discussion of what constitutes stress for children and how control and competence perceptions might relate to stress and its effects.

#### **10.2 Control Perceptions and Biological and Environmental Vulnerabilities**

The concept of personal control appears explicitly or implicitly in the theories presented previously in this introduction. With General Biological Vulnerability, it is important in relation to Behavioural Inhibition (e.g., Kagan, 1997) emotionality, shyness (Buss & Plomin, 1984) and the activation of the BIS system (Gray, 1982). For example, Kagan (1997) has suggested that if the Behaviourally Inhibited child is supported and feels accepted and is encouraged to explore novelty, they are more likely to manage this tendency effectively. However, if critically pushed or

overprotected in novel situations, they are more likely to be avoidant and miss out on learning coping competencies.

In regard to General Psychological Vulnerability, the attachment relationships within a family system (parent-child and parent-parent) explicitly involve a sense of control (Bartholomew & Horowitz, 1991; Bowlby, 1988). Bowlby (1969) in his original conceptualisation of attachment theorised that "control systems" explained the association between negative emotion and insecure attachment. He suggested that children adjusted their attachment behaviours (e.g., crying, talking or approaching) depending on the responses of the caregiver and from these, gradually developed cognitive templates of their acceptability and their worthiness in the eyes of important others. If caregivers responded inconsistently or negatively, the child's expectations of response diminished; they felt unworthy and uncared about, perceived low interpersonal control and felt depressed or anxious. Research with children, adolescents and adults has supported this theoretical relationship between distress and insecure interpersonal relationships (e.g., Carnelley, Pietromonaco & Jaffe, 1994; Persons, Burns, Perloff & Miranda, 1993). Further, research has supported the idea that children who experienced consistently unpredictable caregiver responses and learned that they could not predict outcomes within the relationship were more likely to withdraw, miss out on learning cope skills and believe that they had no control over themselves or others (Rubin & Mills, 1988; see Rubin & Burgess, 2001 for review).

Thurber and Sigman (1998) have suggested that perceived control and perceptions of attachment may develop reciprocally, each affecting the other either negatively or positively as the child interprets their experiences to make meaning of their world. Shear (1991) has also supported the importance of the connection between the early attachment relationship and the development of a sense of control. She states that in being relatively

helpless, the only control the infant and young child can exert over their environment more directly is in the interaction with their caregiver.

Additionally, the environment within the family which impacts upon the child including the parental qualities of acceptance/rejection and sensitivity/psychological control along with family systems constructs (e.g., conflict, democratic decision-making, cohesion, enmeshment) imply an adequate or diminished sense of personal control (Chorpita & Barlow, 1998). For example, an accepting, sensitive parenting style with attention to developmentally appropriate autonomy and consistent limits encourages the development of a sense of mastery, control and competence. This in turn encourages further attempts to experience and gain socialisation skills (Barlow, 2002). As with attachment, the parent's contingent responding allows the child to see how they can get their needs met consistently and predictably and experience a sense of control within the child-caregiver relationship (Barber, 2002). In contrast, it has been seen that either neglectful or overly intrusive parenting does not appear to allow the child to make decisions and instead encourages avoidant solutions associated with anxiety (Siqueland, Kendall & Steinberg, 1996). Likewise family systems that are unpredictable or otherwise problematic (e.g., overly conflicting, not cohesive or alternatively enmeshed and socially isolated) do not allow for the practice of coping skills and may be more likely to lead to distress disorders (Stark, Humphrey, Crook & Lewis, 1990).

Taken together, a sense of control that develops based on multiple influences is fundamental to the model of distress disorder development assessed in the current study. Chorpita and Barlow (1998) contend that the construct of perceived control is a crucial link connecting biological vulnerability and psychological vulnerability and therefore is central to their aetiological model of distress disorders.

### **10.3 The Role of Perceived Control in Barlow's Aetiological Model of Distress**

Chorpita and Barlow (1998) have defined control in their model as "the ability to personally influence events and outcomes [directly or indirectly] in one's environment, principally those related to positive or negative reinforcement" (p. 5). Chorpita (2001) broadened this definition, adding the component of "direct or indirect" in order to allow for the inclusion of help from others as legitimate coping for young children (e.g., through the attachment relationship). The authors also asserted that the theory of Weisz (1986) and his definition of perceived control were most consistent with their definition. In addition to perceived control itself, Weisz (1986, 1990) emphasised two components in his definition: the perception that particular outcomes are within human capacity (labelled contingency) and the perception that the individual is capable of achieving such outcomes themselves (labelled competence). This definition and the research regarding it are discussed in Section 10.7. As described in Chapter 6, Barlow's theory suggests that the accumulation of early experiences with uncontrollable and unpredictable situations may foster beliefs (i.e., cognitive template or schemata) that events are outside their control and cause a general psychological vulnerability to develop feelings of anxiety and other related negative mood states. This 'out of control' state would be further exacerbated when a child is also biologically vulnerable (i.e., emotional, shy or sensitive BIS; see Chapter 5). Finally, these combined General Biological and General Psychological Vulnerabilities could reach disorder severity when particular kinds of stressful events continuously triggered particular disorder symptoms (i.e., Specific Psychological Vulnerability; e.g., chronic fear of social situations leading to Social Phobia). Chorpita and Barlow (1998) contended that in early and middle childhood, it was a child's perception of control which determined whether anxiety and later depressive symptoms would eventuate from early experiences of biological and environmental adversity.

Most important to this model is the means by which perceived control links biological and environmental adversity with distress. Chorpita and Barlow (1998) advance the theory that in early and middle childhood, perceptions of control are responsible for the relationship between adversity and distress symptoms. In other words, if a child feels in control in their life despite adversity, the negative experience would be thought not to lead to anxiety or depressive symptoms (mediation effect; Baron & Kenny, 1986). However, once the child reaches adolescence and enters adulthood, perceptions of control can only reduce distress symptoms, not prevent them from happening (moderation effect; *ibid*, 1986).

#### **10.4 Control in the Literature**

The desire to make decisions and influence outcomes as a means of being in control has been argued as being essential for evolutionary survival (Bandura, 1989; White, 1959). It has been shown that perceptions of control over health and mood in children (Rothbaum & Weisz, 1989; White, 1959) and adults (Langer, 1975; Miller, 1979; Thompson, 1981; Wallston, 1992) has been more predictive of healthy outcomes than not feeling in control. Research and theory support the belief that having control (or believing one has) is good, and, up to a point, the more the better (Evans, Shapiro & Lewis, 1993; Thompson, 1981). Skinner (1996) asserted that actual control experiences are “significant not only because they are powerful affirmations or determinants of changes in subjective control but also because they seem to be the one aspect of control that is unequivocally beneficial” (p. 551). In contrast, a diminished sense of control has been associated with anxiety and depression (Barlow, 2002; Beck & Emery, 1985; Mandler, 1972; Sanderson, Rapee & Barlow, 1989; Weisz, Sweeney, Proffitt & Carr, 1993; Weisz, Weiss, Wasserman & Rintoul, 1987) and other problems (e.g., homesickness; Thurber & Weisz, 1997). As Shapiro, Schwartz and Astin (1996) asserted, one of the strongest and most basic

human needs is to be in control of one's life (Bandura, 1977, 1989; Deci & Ryan, 2002) and to lose that control, one of the most fundamental fears (Seligman, 1975, 1991).

### **10.5 Perceived Control vs. Actual control—what does it matter**

The "illusion of control" (Golin, Terrill & Johnson, 1977; Langer, 1975; Lewinsohn, Mischel, Chaplin & Barton, 1980) or the perception of control, regardless of whether it exists in reality, has been shown in a number of human and animal experiments to be very powerful and an even more powerful predictor of outcome than actual control (Averill, 1973; Burger, 1989). For example, studies where adult subjects were told that they were able to control the stimulus severity during laboratory-induced panic or anxiety consistently showed that anxiety reduced when an illusion of control was present (Geer, Davison & Gatchel, 1970; Sanderson, Rapee & Barlow, 1989; Zvolensky, Eifert, Lejuez & McNeil, 1999). This idea also applies to infants and children. For example, Gunnar (1980) found that 12-month old infant boys who had control over the activation of a fear-provoking toy (i.e., knew when it would activate) showed reduced fear responses and were more likely to approach the toy when they knew the toy would activate. Further, Lewinsohn et al. (1980) asserted that perceptions of control may have the adaptive value of warding off depressive cognitions by encouraging optimism and self-esteem. Alternatively, Abramson, Seligman and Teasdale (1978) found that expecting a task to be impossible was enough to produce helplessness even in situations where objective control was apparent.

Research also suggests that in contrast to clinical populations, normal individuals slightly overestimate the amount of control they have in situations; their ability to acquire control and their belief that they have more skills than they do (Langer, 1975; Lewinsohn et al., 1980; Seligman, 1991). Individuals also typically have the ability to justify unwanted outcomes by attributing the outcomes to temporary conditions (e.g., being

tired), a universal human condition (e.g., no person could hold their breath that long) or situational constraints (e.g., the weather) (Seligman, 1991). Heckhausen and Schultz (1995) suggested that this behaviour was evolutionarily adaptive, at least for the young, as it kept individuals striving to succeed and protected from failure.

Some experience of lack of control can also be beneficial. There is evidence from both animal and human samples to suggest that "toughening up" (Miller, 1980) occurs when a subject overcomes a moderate amount of stress to achieve a positive outcome in a situation where there is relative predictability and controllability. Individuals are then able to use this sense of mastery over a hitherto uncontrollable situation to overcome further stress as long as the process is not protracted (Dienstbier, 1989). In the area of risk and resilience, Garmezy and associates (Garmezy, 1986; Garmezy & Rutter, 1983; Masten et al., 1999) refer to this protective process in children as the "steeling effect" (Garmezy, 1986) where mastery over certain stressors may function as immunisation against the effects of future adversity.

## **10.6 Theories of Perceived Control and Related Conceptualisations**

As mentioned, Chorpita and Barlow (1998; see also Barlow, 2002) contend that Weisz's (1986a, 1986b) definition and theory related to perceived control is closest to their own conceptualisation. In making the case for the central position of perceived control in the model, Barlow (2002; Chorpita & Barlow, 1998) referred to a number of conceptual frameworks. Four of the most influential theoretical frameworks included (a) locus of control (Lefcourt, 1981; Rotter, 1966; Wallston, 1992); (b) attribution theory (Weiner, 1985a, 1985b); (c) learned helplessness or explanatory style (Abramson, Seligman, & Teasdale, 1978); and (d) self-efficacy theory (Bandura, 1977; Bandura, Adams, & Beyer, 1977). Additionally, perceived

competence (Harter, 1982) has been assessed as a stand alone construct related to constructs protecting against negative affect (i.e., self-worth and self-esteem). It is one of the components of perceived control in Weisz's model and is important to discuss here as an individual protective factor before discussing the other conceptual models and Weisz's model, the latter being the one informing the present study. The other theoretical frameworks are mentioned in relation to multidimensional models in Section 10.7 and further explained in Appendix C.

#### **10.6.1 Perceived Competence as related to Distress and Self-Esteem**

From the developmental psychopathology perspective, competence is seen as "a pattern of effective performance in the environment, evaluated from the perspective of development in ecological and cultural context" (Masten & Coatsworth, 1995, p. 724) and is assessed with reference to normative standards for each stage of development. For example, during middle childhood, in western cultures these standards usually include school adjustment and academic achievement, friendships with and acceptance by peers, and rule-abiding conduct (Masten & Coatsworth, 1998; Masten et al., 1995). Masten and Coatsworth (1998) suggested that study of the processes underlying competent functioning provide important clues for prevention and intervention with children. For example, when necessary, assets within the child, like particular skill acquisition or competence enhancement, or external assets, like effective parenting skills, can be improved to mediate the effect of other risk factors on a negative outcome (Masten, 2001). One study of this kind found a change in parenting style predicted child competence, resilience, and change in competence over time. This study also illustrated a reciprocal relationship in that child competence also predicted changes in parenting quality over time (Masten et al., 1999).

As with perceived control, perceptions of competence have been seen to have powerful influences on behaviour and feelings, even when objective evidence exists to the contrary. For example, Miserandino (1996) and Phillips (1984, 1987; Phillips & Zimmerman, 1990) found that academically competent nine and ten year olds (i.e., scholastic aptitude at least 2 years in advance of age) who did not perceive themselves to be competent reported being more anxious, angry, less curious and bored in school and reported avoiding and 'faking' more assignments than did their equally advanced but more confident classmates. These less-confident children also set lower achievement standards for themselves and expected to succeed far less often than children who perceived themselves as being average or highly competent. Teachers reported these children were less persistent than their classmates and their performance declined over the year of study (Miserandino, 1996). Further, children's perceptions of their abilities were found to be influenced by their parents' perceptions of their abilities (Phillips, 1987), indicating the subtle influence of the family environment on academic competence.

Longitudinal studies have reported self-perceived competence to be negatively associated with later self-reported anxiety and depressive symptoms. In a clinical sample of socially anxious 6-11 year olds, low perceptions of social acceptance, global self-esteem and perceptions of peer rejection (e.g., having enemies at school and being made fun of or teased by peers) were associated with high levels of social anxiety (Ginsburg, La Greca & Silverman, 1998). Equally, using another measure of competence in the social domain and a school sample of 7 to 11 year old children whose living situation was unpredictable, Lopez and Little (1996) found support for their hypothesis that higher levels of agency beliefs (similar to competency) were negatively correlated with anxiety levels.

Depressive feelings also appeared to be associated with competence beliefs. Using multiple informants and multiple domains of competence (via Harter,

1985) with a large school sample of 8 and 11 year olds, Seroczynski, Cole and Maxwell (1997) found that scores in multiple domains predicted depressive symptoms. The children who perceived themselves to be competent in multiple domains scored significantly below the mean on the depression index, while those with multiple domains of perceived incompetence scored considerably higher. Further, while positive appraisals of competence in one domain assessed by an important other helped to compensate for incompetence in another domain, the reverse was also true, with criticism and praise from others (i.e., teachers, parents or peers) appearing to have differential effects on depressive symptoms.

#### **10.6.1.1. Developmental Changes in Competence Beliefs**

Several researchers using cross-sectional designs (e.g., Eccles, Wigfield, Harold & Blumenfeld, 1993 ; Marsh, 1989; Nicholls, 1979) examined age differences in children's competence beliefs, and showed that younger children had more positive (and often unrealistically high) competence beliefs and performance expectations across several activity domains compared with older children, at least during primary school (see Stipek & MacIver, 1989, for reviews). Nicholls (1978 cited in Weisz, 1982) found support for the hypothesis that children's accurate self-rankings of competency increased with age. Also, Stipek and Tannat (1978; Ruble, Feldman & Boggiano, 1976 both cited in Weisz, Yeates, Robertson & Beckham, 1982) found that preschoolers to about nine year olds judged their competence in terms of specific accomplishments and not in comparison with others. These competencies appeared to change situationally and failures did not tend to affect self judgements or task persistence at that young age (Rholes, 1981, cited in Weisz & Stipek, 1982). However, later research has suggested that judging oneself as good or bad can affect beginning feelings of self-worth even in preschoolers (Burhans & Dweck, 1995).

Longitudinal data has supported cross-sectional reports. A three year study (Wigfield et al., 1997) found confirmation that competence beliefs reduced with age. Specifically they found that six and seven year olds overestimated their abilities and the singular importance of effort in achievement. By 10 years old children were becoming more realistic and more able to include other elements like realistic abilities, desire and the opinion of others as related to their appraisal of self-competence in a particular domain. Hence, competence beliefs become more stable and more reality-based over time but children in middle childhood still relate the general importance of the task to their perceived ability to do it. These beliefs were also more related to parents' evaluation than to teachers' opinions, suggesting the influence of the family in shaping self-competence beliefs. Another four year longitudinal study with primary school children (Cole, Jacquez & Maschman, 2001) also reported that the child's competence beliefs became more stable with age, were influenced by parent appraisals and, if negative, appeared to affect depressive symptoms over time. The researchers concluded that, because of preadolescent children's increasing ability to take another's perspective and to socially compare and evaluate their performance based on that of others, they were more prone to be emotionally affected by the opinions of others and more vulnerable to distress symptoms if these self-appraisals were negative (Cole et al., 2001). Although these studies did not address the issue of which domain of competence was most salient in relation to distress symptoms, it would appear that the area of social competence (being able to relate to others) would help to protect a child from distress at this time.

#### **10.6.1.2. Domains of Competence**

Longitudinal research has appeared to differentiate between the domains. A structural analysis of the academic, social and conduct domains of competence (Harter, 1985) was done with a sample of children between 8 and 12 years old and again when they were 17-23 (Masten & Coatsworth, 1998; Masten et al., 1995). While all three dimensions of competence were

moderately related in childhood, only academic competence and behavioural competence were related in late adolescence. While behavioural incompetence in adolescence appeared to undermine academic and job competence and could be predicted from childhood measures, adolescent social competence did not appear to relate to childhood social competence. This could suggest that, developmentally, perceptions of conduct and academic skill are more firmly established in childhood while competence with peers may have a second chance to flourish as friendships and socialisation develops.

Despite the previous findings that social competence may be less crucial in childhood, social support outside the home and friendships appear to be important, at least in some circumstances. For example, in a sample of homeless and economically distressed 7 to 12 year old children, perceptions of competence were associated with the existence of social support systems outside the family (Graham-Bermann, Coupet, Egler & Mattis, 1996). One study found a generally stronger relationship between child competence in a sample of 9-11 year olds (via Harter's perceived competence scale) and family cohesion and adaptability when children did not have a close friend (Gauze, Bukowski, Aquan-Assee & Sippola, 1996). However, with children whose families were low in cohesion and adaptability, child competence was more strongly linked to friendship than for children in more functional homes. This finding indicates that children may be able to compensate for poor family relationships with friendship support outside the family. Another longitudinal study of children from age 4 to 8 years reported different results. Booth, Rubin and Ross-Krasnor (1998) found no differentiation between the identification of a best friend for securely attached or insecurely attached children. However, while having a best friend predicted social competence in secure children, the reliance on a best friend for emotional support appeared to cause problems (i.e., externalising behaviours) for insecurely attached children in this study. Additionally, lack of friendships early seems to relate to later perceptions of competence. For example,

longitudinal data from a Canadian school sample indicated that social withdrawal at age 7 predicted a negative competence rating, loneliness and feelings of insecurity at 14 years (Rubin, Chen, McDougall, & Bowker, 1995, cited in Rubin & Burgess, 2001). These varying results illustrate the complicated nature of relationships involving support, cognitive constructs and emotional adjustment.

### **10.7 Framework for Multidimensional Integrated Models of Perceived Control**

Weisz's (1986 Weisz & Stipek, 1982) competence and contingency constructs are included in more recent integrated models of perceived control including Barlow's. Other such models define the constructs differently (see Section 10.7.1.). Because of the difficulties in comparing the research generated from the different theories, Skinner developed a framework of agent-ends, agent-means and means-end relations (Skinner, 1991) and compiled a classification guide of perceived control constructs (Skinner, 1996).

Skinner (1996) suggested that within the broad range of constructs in the area of control, there was a prototypical control construct, personal control, which directly mirrored control experiences throughout life and whose elements could be useful in analysing the constructs from different theories of control. According to the framework proposed, this central construct involved three elements: "the self as agent, the self's actions or behaviours as the means and an effected change in the social or physical environment as the outcome" or ends (Skinner, 1996, p.558). Skinner (1996) believed that two conditions were required for both actual and perceived control: "a view of the self as competent and efficacious and a view of the world as structured and responsive" (Skinner, 1996, p. 559). Each have a set of beliefs represented as separate cognitive constructs. Skinner (1996) suggested that Weisz's CCC model (Weisz, 1986; Weisz & Stipek, 1982) and

Bandura's self-efficacy theories (Bandura, 1977) reflected these conditions most accurately. The other theorists were thought to measure a single construct at a time. For example, locus of control theorists concentrated on means-ends relations (except Wallston's, 1992, addition of self-efficacy); attributional studies implied but did not differentiate between means-ends (i.e., attributions) relationships and agent-means beliefs (i.e., causes) in their focus on causes of outcomes; reformulated learned-helplessness theorists tended to study separately the concepts of universal helplessness (contingencies or means-ends relations) and personal helplessness (competence or agent-means relations). Additionally, although Bandura's (1977) self-efficacy theory included means-end (response-outcome expectations), agent-means (self-efficacy) and agent-end (Proxy control) beliefs, he tended to concentrate almost exclusively on measurements of self-efficacy beliefs (agent-means). Skinner (1996) described a number of methodological problems of confusing definitions and confounding measures. She suggested that only Weisz and Skinner and colleagues measured all three components together. Given the focus on Weisz' model in the current study, it is now discussed, first within the context of similar multi-dimensional models and then in relation to its component parts.

### **10.7.1 Multidimensional Conceptualisations of Perceived Control**

A number of multidimensional theories of perceived control have tried to preserve the uniqueness of the constructs in earlier theories as well as integrate them. Theorists have integrated two perceived control constructs which seem to capture the essence of most of these earlier theories. These are described as: an individual's view of whether a task is able to be accomplished; and their view of their competence and efficaciousness to carry out a task. Different theorists and researchers refer to these two constructs respectively in various ways: strategy and capacity (Skinner, Chapman & Baltes, 1988); means-ends and agency (Little & Lopez, 1997)

and contingency and competence (Weisz, 1986; Weisz & Stipek, 1982). The first two models initially from the Max Planck group in Germany, have focused in the area of scholastic achievement (Heckhausen & Schulz, 1995). The third model (e.g., Weisz, 1990) has concentrated on understanding control perceptions in relation to development, cultural difference and psychopathology, initially developing perceived control constructs in relationship to child adjustment and negative emotions. This third model has incorporated Harter's (1982, 1985b) concept of perceived competence into their model. While actual competence and perceived competence have been associated with negative affect in numerous studies (see Section 10.6.1), Weisz (1990) has suggested that, when added to contingency and perceived control, the combined measures are more able than competence alone to explain developmental changes, discriminate between disorders and to account for more variance in depression scores.

An example of research from the first two models relates to attachment and the current study. In a 5 year longitudinal study with 1600 children, Skinner, Zimmer-Gembeck and Connell (1998) found that children who experienced warm, contingent teachers were more motivated in the classroom, achieved better results and maintained optimistic beliefs about their competence abilities. Children who perceived their teachers to be noncontingent tended to engage in the classroom activities less and achieved lower academic results that then related to these children increasingly doubting their own abilities and believing more in the power of luck and unknown causes for success. These results suggest that primary school teachers become attachment figures and that they can affect cognitive perceptions.

### **10.7.2 Weisz's Control, Competence and Contingency Model of Perceived Control**

Weisz's model of contingency beliefs, competence beliefs and perceived control judgements has been applied more in the area of psychopathology and, as introduced earlier, is closest to Barlow's definition of perceived control. That model is presented now in more depth. Rosenberg (1990) contended that research with this model of perceived control has advanced the field considerably, not only because of the accumulation of empirical and theory-based research but also because the model appears to "integrate concepts of locus of control, self-efficacy, learned helplessness, mastery and powerfulness" (pp. 147).

Weisz and Stipek (1982) developed a dimensional model of control judgements to use with children (the contingency-competence-control model; CCC model; Weisz, 1986a, 1986b, 1990; Weisz & Stipek, 1982). Control here was defined as the ability to cause an intended outcome (e.g., getting a desired mark on a test or making a friend) and was conceptualised as a joint function of outcome contingency (the belief that the outcome was dependent on a specific behaviour, like maths ability or an ability to talk easily) and personal competence (the belief that the individual was capable of performing the specific behaviour). Weisz (1990) contended that although both contingency and competence were necessary to predict control and accounted for a major part of the variance, other aspects of control that were temporary or based on recent events (e.g., the temporary bad mood of a coach or confidence from passing a recent test) could be captured with a specific measure of perceived control to account for additional variance in how much the child can produce the desired outcomes if they try (personal communication, John Weisz, June 1999). Weisz's measure assessed control beliefs in the areas of academics, social abilities and behavioural control. Thurber and Sigman (1998, 1999) added two further control domains, the ability to control emotions and the ability to get

help from others which they found to be associated with feelings of distress and homesickness in preadolescents. Weisz (1990) believed that his original model had roughly compatible concepts to Skinner's perceived control, capacity beliefs and strategy beliefs (Skinner, 1996; Skinner et al., 1988, 1990), self-efficacy theory (Bandura, 1977) and the reformulated learned helplessness theory (Abramson, Seligman & Teasdale, 1978). However, Weisz (1990) asserted that his CCC (i.e., contingency, competence and control) model was more concerned with the individual's "capacity to exert control" (Weisz, 1990, pp. 105) than the desire to do so. It therefore did not include aspects of motivation, values or causal attributions as does Skinner's model, nor did it include assessments of abilities as does Bandura's self-efficacy model.

Research with children and adolescents in both clinical and school populations using Weisz's measures of perceived control has confirmed a relationship between depression and low perceived control in social, academic and behaviour domains (Weisz, Southam-Gerow, McCarthy, 2001; Weisz et al., 1989; Weisz, Sweeney, Proffitt & Carr, 1993; Weisz, Weiss, Wasserman & Rintoul, 1987). The CCC model of perceived control also accounted for different patterns of variance in depression symptoms and conduct disorder symptoms, suggesting diagnostic specificity (Han, Weisz & Weiss, 2001; Weisz, Southam-Gerow & McCarthy, 2001).

Rothbaum, Weisz and Snyder (1982) added another dimension to this theory which may facilitate further understanding of children's coping. A two-process model of control distinguishes between primary control (i.e., actively working to get objective conditions to fit oneself) and secondary control (i.e., adjusting oneself to "fit in with the world" and "flow with the current", Rothbaum et al., 1982, p.8). Secondary control was considered to develop later than primary control (6-8 years old vs. 4-5 years old, respectively ; see review by Compas, Banez, Malcarne & Worsham, 1991). However, there has been a question about what secondary control measures. Skinner

(1996; see also, Heckhausen & Schultz, 1995) suggested that secondary control functioned to minimise losses after primary control had failed to achieve the desired outcome. This suggested to Skinner (1996) that it may be more appropriately considered a potential consequence of perceived control than an actual control strategy per se.

There are developmental differences concerning the CCC model itself, especially pertaining to the function of perceived contingency. Studies have determined that developmentally younger children have no sense of noncontingency (i.e., they believe that anything in the world can be influenced, with effort, by themselves or someone more powerful) (e.g., Weisz, 1990). So, while contingency makes a difference, it is not recognised by them, and therefore, does not appear to influence affective expression. For example, experiments with 5 and 9-10 year olds with a clearly 'chance' (non-contingent) game of cards indicate that younger children attributed success at the game to the personal attributes of the winners (e.g., intelligence or practice) while the older children generally attributed success to good luck, although there was still a tendency to view this as an acquired skill (Weisz, 1980, 1981).

With their apparent inability to comprehend non-contingency, young children are also thought to be unlikely to understand unfairness and would attribute their failure to the quality of their behaviour (i.e., their competence). This idea was also supported in studies where young children (e.g., 6-8 years) appeared convinced that even blatant inequity was a result of their own lack of competence while older children (e.g., 11 years) were able to pick the inequity in the situation (Gray-Little & Teddlie, 1978; Gray-Little, 1981, cited in Weisz, 1981). Likewise as children get older, as indicated in the previous section, they are more able to judge their competencies accurately (Weisz, 1990). Skinner's work with a longitudinal sample in the domain of academic motivation (Skinner, Zimmer-Gembeck & Connell, 1998) also found that beliefs which regulated engagement in tasks changed in preadolescence (11-

12 year old) from effort to ability and from the belief that anyone could do anything in school with effort (i.e., contingency beliefs) to the belief that school performance was limited by their own ability (involving competence).

Together, these findings indicate that in middle childhood, perceived competency appears to be a more salient discriminating cognitive factor than contingency in relation to distress at that developmental stage. Assessing the varying influence of contingency and competence on depressive symptoms using structural equation modelling (SEM), Weisz et al. (2001) found that, with a clinical sample of children (8-11 years), perceived control and competence but not contingency were related to depressed feelings. This finding was supported by another study using SEM analysis and a community sample of children (aged 10-14 years). In this sample, perceived contingency did not significantly relate to either anxious or depressed feelings either concurrently or prospectively (Muris, Schouten, Meesters & Gijbbers, 2003). Also, similar to the Weisz et al. (2001) findings, perceived competence contributed most to the prediction of self-reported anxious and depressed feelings both concurrently and at four week follow-up. Perceived control concurrently predicted depressive but not anxious symptoms. Other clinical samples using similar measures but different methods have supported the findings of these two studies (e.g., Han et al., 2001; Weisz et al., 1987; Weisz et al., 1989). However an earlier study using a community sample of 116 children (8-12 years old) found that control, contingency and competence beliefs together contributed significantly to depressive symptoms (Weisz, Sweeney, Proffitt, & Carr, 1993). This finding may relate to the use of less sophisticated methods in the earlier study (e.g., multiple regression vs. SEM analysis) that didn't partial specific effects.

To summarise how control-related beliefs develop and change over time, Weisz (1980, 1986b, 1990) postulated and research has corroborated that during childhood, control strategies change from an image of the external

world that includes an egocentric, omnipotent view of self to an increasingly more realistic view of what that individual actually can do (competencies) and what is possible (i.e., contingencies) (Rothbaum, Weisz & Snyder, 1982; Weisz, 1990). While this more realistic view may have advantages for some, more accurate judgements of abilities may contribute to the decline in academic engagement observed in middle childhood (Skinner et al., 1998).

In summarising findings in this area, Weisz et al., (2001, see also Muris et al., 2003) concluded that while children in middle childhood were able to be more realistic about their competencies and saw them as being related to depressed and anxious feelings (i.e., possibly beginning as young as four years old; Burhams & Dweck, 1995), they were still not developmentally able to relate contingency to affective outcomes in the same manner, whereas adolescents were. It may be that what is not possible (noncontingency) does not affect feelings until after middle childhood (e.g., Muris et al., 2003; Weisz et al., 2001). For example, Weisz and Stipek (1982) found that young children and those in middle childhood tended to blame themselves when it wasn't warranted (e.g., objectively the teacher was having a bad day). Together, these findings suggest that children in middle childhood have more mature understandings of competencies but, as yet, appear to lack the cognitive maturity to be emotionally affected by what is contingently impossible (e.g., the realisation that individual effort cannot stop wars). Hence, with a sample of preadolescent children, the strongest influence on negative affect appears to be control beliefs and beliefs about personal competence. As a result of these findings, a relatively large battery of measures and conclusions by Weisz et al. (2001) and Muris et al. (2003), the current study assessed the role of perceived competence and perceived control, but not contingency. It also included additional control indicators linked to Weisz's model: Thurber and Sigman's (1998) measures of emotional and attachment control.

In summary, research with children and adolescents in both clinical and school populations using Weisz's perceived control and Harter's (1982) perceived competence measures has confirmed a relationship between depression and low perceived control and competence in social, academic and behaviour domains (Weisz et al., 2001; Weisz et al., 1989; Weisz, Sweeney, Proffitt & Carr, 1993; Weisz, Weiss, Wasserman & Rintoul, 1987), between anxiety and depression concurrently and prospectively (Muris et al., 2003) and between these and two additional control beliefs (i.e., emotional control and attachment control) and distress and homesickness (Thurber & Sigman, 1998, 1999). It remains to be seen whether control and competence beliefs in any or all of the domains studied fit within a multivariate model that includes temperament, attachment, parenting and family factors.

### **10.8 Antecedents of Perceived Control in Relation to Distress**

It has been established that perceptions of control and competence are related to distress (see also Appendix C for other models). As well as what has been mentioned in child research, a number of researchers have found that a sudden sense of diminished control is associated with a direct expression of negative emotion (Barlow, 1991, 2002; Beck & Emery, 1985; Mandler, 1972; Sanderson, Rapee & Barlow, 1989). Conversely, even the illusion of control during laboratory-induced anxiety in adults (e.g., Zvolensky, Eifert, Lejuez & McNeil, 1999) and children (Gunnar, 1980) has reduced panic and fear responses. A question unanswered as yet is what influences the development of these control perceptions? This section examines first animal evidence of the link between perceived control and distress followed by how perceived control and distress are connected in human research.

### **10.8.1 Animal Models Relating Antecedents of Perceived Control to Distress**

The relationship between early environment and perceived control has been studied extensively in animal populations. Over the past fifty years, experimenters like Pavlov, Liddell, Masserman and Wolpe, have induced, either by accident or intentionally, behaviours in animals similar to anxious apprehension demonstrated by humans. They have consistently found that continual aversive experiences accompanied by diminished control over these stimuli caused behaviours which indicated a sense of helplessness. Further, this helplessness remained in dogs even when the opportunity to escape was apparent (i.e., learned helplessness; e.g., Overmier & Seligman, 1967 cited in Seligman, 1975).

Corroborating evidence for the connection between early experiences of control and distress came from Mineka and Kihlstrom's (1978) review of early animal experiments. They concluded that the cause of anxiety in the animals was "environmental events of vital importance to the organism becoming unpredictable, uncontrollable or both" (p.257). Moreover, there was evidence to indicate that when animals had control over events early in their lives (control over when and how much they were fed) and not just over aversive stimuli, they appeared to be immune to the long-term neurosis-inducing effects of punishment. For example, Mineka, Gunnar & Champoux (1986), who reared 3 groups of rhesus monkeys in peer groups for 12 months away from their mothers, found that the group which had complete control over the delivery of food, water and toys was later more able to cope with novelty and separation from peers, was more exploratory and less fearful than either of the groups who had no control over food, water or toys. Hence, control over normal events early in life appeared to inoculate against the creation of a vulnerability to anxiety features in animals. Additionally, continual lack of control appeared to affect neurophysiological functioning. Sapolsky and colleagues (1989, 1990; Ray

& Sapolsky, 1992) found that those male baboons who had less control over their sexual needs (i.e., who were continual targets for unpredictable aggression and interruption in courtship attempts) had hypercortisolism associated with chronic anxiety while those who had control over social relationships and sexual contacts had significantly lower cortisol levels.

Further evidence from experiments with cats, monkeys and rats has suggested that remediation in the area of control perceptions may have lasting effects. Teaching a sense of mastery or control to timid animals during early development tends to protect animals against developing anxious responses as adults (e.g., Adamec & Stirt-Adamec, 1986; Francis, Diorio, Liu & Meaney, 1999; Suomi, 1999, 2000).

In summary, animal research has highlighted the importance of early experience of uncontrollability and unpredictability in affecting anxious responses. While a fearful environment can enhance apprehension and even affect brain function, a nurturing environment can increase adaptive functioning, even across generations.

### **10.8.2 Family Antecedents of Perceived Control and Distress in Humans**

The models and research of control and competence theorists have related perceived control and perceived competence directly to distress (see Section 10.7. and Appendix C). Although theory has supported the idea that control perceptions develop from early experiences of control in the family and may play a major role in the development of later distress disorders, there has been little research which has directly related these constructs or assessed whether these constructs relate to each other in the same way when children are at different ages (Chorpita & Barlow, 1998). One cross-sectional study which did relate family control, locus of control and distress symptoms in a sample of latency aged clinically anxious children and

controls found that locus of control mediated the relationship between a controlling family and distress symptoms (Chorpita, Brown & Barlow, 1998, see also Section 11.1.2. for more detailed review as it relates to the current study's methodology). Another study found a relationship between control-related cognitions, perceived parental critical messages and depression severity, but not anxiety severity. The relationship between critical messages and depression was found to be mediated by control-related cognitions (Stark, Schmidt & Joiner Jr., 1996). A further cross-sectional study which did not assess mediating or moderating effects found parental characteristics of overprotection and low care were related to an external locus of control and anxiety disorders as well as trait anxiety symptoms in adolescents (Bennet & Stirling, 1998).

With only this limited and slightly tangential evidence, Chorpita and Barlow (1998) contended that in order to find proper support for the role of the family and control cognitions in the process of distress disorder development in children, it is necessary to determine whether the antecedents to control were similar to the antecedents to distress. If they were, it would be possible that family and other characteristics, control cognitions and distress were connected in a mediational way in childhood (Chorpita & Barlow, 1998). Evidence presented in Chapters 8 and 9 have shown how parent characteristics of psychological control/sensitivity and rejection/acceptance and family characteristics of cohesiveness, conflict, enmeshment and sociability have been related to perceptions of control and distress both theoretically and empirically. Further, because temperament (Chapter 5) and attachment relationships (Chapter 7) in the family have also been linked to control perceptions and distress, these too are implicated. Findings, including some which were reviewed earlier are now assembled in this chapter and related to the development of control and distress.

### **10.8.3 The Development of Control-related Cognitions**

It may be logically expected that more parental attention would be associated with the development of a child's sense of control over their environment. Research has supported this expectation showing that first-born children tend to display an internal sense of control (Crandall, Katkovsky & Crandall, 1965; Hoffman & Teyber, 1979) and showing that later-born children from large families display more external locus of control beliefs (Walter & Ziegler, 1980; cited in Chorpita & Barlow, 1998). These have not been necessarily associated with distress or well-being, however.

Likewise, as reported more extensively in Section 8.9, researchers using various methodologies found that parents who were more contingently responsive (Davis & Phares, 1969; Schneewind, 1995); warm and accepting (Carton & Nowicki, 1994) and more encouraging and rewarding of skill development and independent learning with support (Chandler, Wolf, Cook & Dugovics, 1980; Gordon, Nowicki & Wichern, 1981) were more likely to have children with an internal locus of control. Schneewind (1995) also reported that in addition to emotionally supportive and sensitive parenting, a positive family environment which included recreational, cultural and social activities outside the home was associated with an internal locus of control in children (Bradley & Caldwell, 1979; Nowicki & Schneewind, 1982).

Conversely, an external locus of control was associated with more adverse family conditions. Carton and Nowicki's (1994) extensive review found that children who reported an external locus of control tended to have more intrusive, overprotective, punitive and rejecting parents who were more preoccupied (e.g., were struggling with a divorce vs. dealing with it) and were experiencing more stressful life events than those with an internal locus of control.

The attachment literature has also shown that these same qualities of parental acceptance and encouragement have been associated with children who are securely attached, and, in turn, have also been associated with mastery in children (see also Sections 7.4.1., 7.5., 7.6.). For example, parents who were responsive and who were observed to be encouraging of a child-focused rather than a parent-focused solution to a problem were seen to have securely attached children who were more curious, less likely to give up and more socially able to negotiate solutions (Meins, 1997). Sensitive parenting (Fonagy et al., 1991; Koren-Karie et al., 2002) discriminated between securely and insecurely attached children, lending credence to the association between parenting styles, the attachment relationship and perceptions of control. Further, biologically inhibited children were able to manage the stress of novelty (i.e., a clown) only when they had a secure attachment relationship with their mother (Nachmias, Gunnar, Mangelsdorf, Parritz and Buss, 1996). Thompson (2001) suggested that a secure attachment relationship as a result of warm, contingent parenting would help emotionally vulnerable children to learn skills to manage these emotions. Attachment theory would suggest that this would also be accompanied by feelings of control over themselves and the certainty that others would treat them fairly (Bowlby, 1988). Chorpita and Barlow (1998) also made the point that attachment relationships were where various control-related beliefs were fostered as a secure attachment would require both control and predictability. From the evidence provided, it appears that the attachment relationship is quite closely related to control beliefs both theoretically and empirically. Attachment beliefs may either precede control perceptions and be an aspect of more general control perceptions (Chorpita & Barlow, 1998) or the two may grow symbiotically (Thurber & Sigman, 1998). Either way, these two concepts seem to be inextricably linked.

In summary, there seems to be a convincing link between warm, contingent, sensitive- parenting or alternatively, overprotection, rejection and more or less control-related cognitions, respectively, from diverse research areas

(e.g., see Carton & Nowicki, 1994; Schneewind, 1995 for review). The attachment literature has also lent support to this relationship as sensitive, contingent parenting is also associated with secure attachment and a child's cognitive belief in their worth in relationship to their caregiver. Although little evidence for the relationship between control perceptions and other family factors (e.g., conflict, cohesion, enmeshment and lack of democratic decision-making,) has been found (see Bradley & Caldwell, 1979; Nowicki & Schneewind, 1982 for exceptions), such characteristics in a family would suggest a diminished sense of control.

While less evidence relates these factors to control, the family characteristics of psychological control and rejection have been seen to relate to distress in children more convincingly (see Section 8.7.). For example, one concurrent study found that distressed children described their parents as less warm and more psychologically controlling and observed the parents to be less contingent and more controlling (e.g., Siqueland, Kendall & Steinberg, 1996). Similarly, Messer and Beidel (1994) found that 8-12 year old children diagnosed with anxiety disorders reported their families were more controlling and allowed them less independence than did children with either test anxiety or no anxiety. A further longitudinal study found parents who used forms of psychological control on well-behaved children from when the children were 5 years old, tended to produce adolescents who showed anxious behaviours at 13 years old (Pettit & Laird, 2002). Retrospective and concurrent accounts from anxious patients have also supported the contention that overprotective or psychologically controlling and rejecting parenting is related to distress (e.g., Bennett & Stirling, 1998; Parker, 1981; Silove, Parker, Hadzi-Pavovic, Manicavasagar & Blaszczyński, 1991).

Relating distress development to family functioning in childhood, Williams et al. (1990) found in a New Zealand sample that 11 year old children whose mothers had earlier reported low levels of cohesion and expressiveness (i.e., lack of freedom to express emotions; Bloom & McNaar, 1994) and high

levels of conflict in the family (McGee et al., 1990) displayed symptoms of anxiety and depression. Two further studies found that less family cohesion and more family conflict were associated with suicidal tendencies (i.e., thoughts and attempts) and higher depressive symptoms in inpatients children (aged 6-13) compared with their nonsuicidal counterparts (Asarnow, 1992; Asarnow, Carlson & Guthrie, 1987). Similarly, Stark, Humphrey, Crook and Lewis (1990) found family conditions of high conflict, high enmeshment and low cohesion, democratic family decision-making and sociability to discriminate between distressed children and nonclinical controls in middle childhood.

Taken together, similar parenting and family characteristics have been linked to attachment perceptions, to control perceptions and to distress. Concluding their discussion of this literature, Chorpita and Barlow (1998) suggested that accepting, responsive parents would foster the development of "control over reinforcing events in early development, through social contingency and mastery of the environment" (p. 10). These positive experiences would accumulate and be stored in the brain as learned regularities that could play a role in creating a generalised sense of control (Carton & Nowicki, 1994). Evidence that links family and parenting characteristics with control cognitions and with distress is growing, but is not conclusive. With limited studies relating all relevant constructs reviewed in this literature review (Bennett & Stirling, 1998; Chorpita, Brown & Barlow, 1998; Stark, Schmidt & Joiner Jr., 1996), there is still more research clearly required to support the theoretical models. Greenberg (1999; see also Thompson, 1998) reviewed family factors related to attachment and distress and concluded that more research involving multiple risk and protective factors including family circumstances, attachment, temperamental vulnerability and cognitive factors was required as relationships between the variables were complex and pathways to disorders were multiple.

As mentioned, two studies which assessed aspects of all three constructs: family, cognition and distress have demonstrated a mediational effect of the control cognitions between parental control and distress symptoms in samples of anxious and depressed preadolescents (Chorpita, Brown & Barlow, 1998; Stark, Schmidt & Joiner Jr., 1996). The question remains of whether this mediation relationship is present when using a community sample of preadolescents, when using more precise measures of control and when other vulnerabilities and protective factors are added. Additionally, what are the implications of perceptions of control mediating the relationship between family adversity and distress? This will be the topic of the next section.

### **10.9 Control Cognitions as Mediators or Moderators of Distress Development**

Whether control-related cognitions function as mediators or moderators in relation to biological and environmental adversity and distress is one major focus of the present study. The "mediation" model suggests that negative life events activate a sense of diminished control which in turn contributes to the development of anxiety and depression. Alternatively, the "moderational" model demonstrates a direct relationship between negative life stresses and the development of anxiety and depression which is enhanced or reduced by control-related cognitions.

A number of cognitive and cognitive-affective theories have implied a moderational relationship in their diathesis-stress models of disorder development (Alloy, Kelly, Mineka & Clements, 1990; Barlow, 1991; Beck & Emery, 1985). This moderational model has also had consistent empirical support in adult studies (e.g., Abramson, Metalsky & Alloy, 1989; Hammen, Adrian & Hiroto, 1988). Barlow and colleagues model (2002; Chorpita & Barlow, 1998) suggests that cognitive concepts function differently in children. They postulate that rather than being fixed as with adults, the

cognitive style in children may be still forming and therefore be more malleable. Specifically, they suggest that the cognitive construct of perceived control plays a mediating role between adversity and distress rather than the moderating one seen with adolescents and adults. That is, in childhood, a feeling of control can determine whether distress will occur while in adolescents and adults, distress will only be increased or reduced by a perception of control since the connection between biological and environmental stress and distress has been more firmly established. Evidence for this hypothesis emerged first from cross-sectional and longitudinal studies of attribution and depression (e.g., Nolen-Hoeksema, Girgus & Seligman, 1992; Cole & Turner, 1993; see also Appendix C). Findings from this research support a mediational model in middle childhood compared to adolescence and adulthood.

Chorpita, Brown and Barlow (1998) found locus of control perceptions to mediate the relationship between family control and negative affect in a mostly clinical sample of preadolescents. Similarly, Stark, Schmidt and Joiner Jr. (1996) found the relationship between child perceptions of parental critical messages and depression was mediated by control-related cognitions in another clinical sample of preadolescent children. The present study assesses a similar, expanded model. Having discussed the possible antecedents of distress in children and explored how control-related perceptions may be related, the chapter concludes with a brief discussion of what constitutes stress for children and how perceptions of control and competence may be instrumental in preventing the long-term effects of stress.

### **10.10 Perceived Control and Competence as a Foundation for Resilience to Stress**

Lazarus and Folkman (1984) described stressful events as those that could potentially cause an imbalance between environmental demands and an

individual's skills for coping with those demands. Stress has been consistently associated with children's adjustment problems (e.g., Compas, Connor-Smith, Saltzman, Thomsen & Wadsworth, 2001; Dubow, Edwards & Ippolito, 1997, Dubow & Tisak, 1989; Jackson & Warren, 2000). Stress has been operationalised as traumatic (e.g., major life events like parental divorce, death of a family member; Sandler, Wolchik, Braver, & Fogas, 1991), moderate (e.g., having trouble in school or with a sibling; Jackson & Warren, 2000), or pervasive (e.g., an accumulation of demographic predictors of family adversity like poverty or homelessness, parental distress). Life events that have been more salient are those that directly affect the life of the child (e.g., parental divorce, separation; Hetherington, Cox & Cox, 1985). However, even normal transitional experiences such as school entry have been found to relate to internalising problems in children (Rende & Plomin, 1992). Skinner, Zimmer-Gembeck and Connell (1998) found that the loss of control felt by children going from primary to intermediate school reduced coping skills significantly for some and suggested that this contributed to increased avoidance of engagement with school observed in those children at that age. Masten, Miliotis, Graham-Bermann, Ramirez, and Neemann (1993) found that an accumulation of chronic risk and recent onset of negative life events best predicted adjustment problems in children from disadvantaged communities. Likewise, New Zealand longitudinal research points to an accumulation of childhood circumstances being significantly related to increased risk of adolescent psychopathology (Fergusson & Lynskey, 1993). Together, this evidence suggests further that multiple experiences of 'out of control' situations are related to adjustment problems in children.

Resiliency research has helped to identify what factors help a child to negotiate these risk situations to cope under adversity and has contributed in a major way to intervention strategies with children at risk of psychopathology (Haggerty, Sherrod, Garmezy & Rutter, 1994; Masten, 2001; Masten & Coatsworth, 1998). It has been suggested that factors

which promote health in the face of adversity could be incorporated into intervention programmes early to protect at-risk children from future adjustment problems (D'Imperio, Dubow & Ippolito, 2000). Such adjustment-promoting factors include perceived competence and cognitive and emotional regulation skills combined with external factors like family cohesion, absence of conflict and support outside the family that encourages and reinforces the child's attempts at coping (Rutter, 1987; Werner, 1990). Weisz and colleagues suggest that perceptions of control are resilience factors related to coping with stress particularly in primary school aged children (e.g., Weisz, Southam-Gerow & McCarthy, 2001).

What may contribute to the feelings of control and competence may be specific skills which can be taught. A review of child and adolescent coping and adjustment (Fields & Prinz 1997), found that coping strategies associated with better adjustment in middle childhood (defined by fewer distress symptoms) were problem-solving as well as cognitive strategies like self-soothing and cognitive distraction. Poorer adjustment with more severe internalising symptoms were associated with negative self-talk, focus on negative affect, excessive support-seeking, involving themselves in parental disputes and escape thoughts. In studies where these internalising symptoms were related to adjustment, 'cognitive and practical strategies, seeking alternative rewards and approach strategies of social support, problem solving and cognitive reappraisal' were shown to be associated with adjustment while 'ventilating, resigned acceptance and cognitive and behavioural avoidance strategies' were associated with poorer adjustment (Fields & Prinz, 1997 p. 969). With the exception of the obvious learning component of particular problem-solving and social engagement skills, it may be argued that a child's perceived sense of control and sense of competence in their ability may calm a child allowing them to choose the most effective strategy for the task at hand. So, either teaching skills in order to feel in control or supporting a child to recognise and trust their abilities to take charge of a situation would be thought to have a similar

adjustment effect. Given the practical and scientific merits, it is useful to explore further the relationship between adversity, cognitions and distress.

### **10.11 Chapter Summary**

Theoretical and empirical evidence has been presented to suggest that perceptions of control and competence may be of great importance in protecting a child from developing a distress disorder when they are biologically and psychologically vulnerable as a result of early adversity. Evidence from this and other chapters has shown that inherited emotionality and shyness are related to later social dysfunction. Additionally, early environmental adversity from an insecure attachment, psychologically controlling and rejecting parents or general family environmental factors (e.g., enmeshment, conflict, lack of cohesion) contribute to feelings of distress in children. Limited evidence suggests that perceptions of control or competence may prevent those distressed feelings if they are able to be accessed by the child before they become fixed in adolescence. More research is required to support the idea that the cognitive constructs of perceived control and perceived competence can protect a child in middle childhood from the development of distress symptoms in the face of multiple biological and family risk factors. The final introductory chapter describes more precisely the construction of a model of distress development in children in middle childhood which includes the biological and psychological risks and cognitive constructs discussed in this and previous chapters.

## **CHAPTER 11.**

### **DEVELOPING A BIOPSYCHOSOCIAL AETIOLOGICAL MODEL OF DISTRESS DISORDERS IN CHILDREN**

This chapter presents the rationale for the current study, including the goals and issues in need of examination and the tools and methods used to explore them. The models to be assessed are presented and are followed by the hypotheses to be tested.

#### **11.1. Primary Goals of the Study**

The general purpose of the study reported in this dissertation was to investigate how children's cognitive perceptions of control are associated with their temperamental emotionality and shyness, their parent's personal vulnerabilities and their family environment and how both the cognitive perceptions and the vulnerability factors are related to child reported features of distress (i.e., anxiety and depression) and parent-reported emotional behaviours. That is, a primary focus of this study was to determine whether perceptions of control in a school sample of eight to eleven year olds were sufficient to protect children from anxious or depressed feelings when there were biological and environmental adversities present in their lives. This investigation has been prompted by: recent policy directions emphasising the importance of identifying and addressing the problems related to multicomponential risks to psychological health in children (Chapter 1); recent interactive theories which have begun to relate multiple components to the development of distress disorders in children (Chorpita & Barlow, 1998; Manassis & Brady, 1994; Stemmerger, Turner, Beidel & Calhoun, 1995); and the burgeoning research which has emphasised cognitive perceptions as salient protection against the

development of distress disorders in children (Chorpita, Brown & Barlow, 1998). This investigation draws from multidisciplinary research interests in the maturing field of developmental psychopathology and more specifically how biological predisposition, the attachment relationship, family characteristics and cognitive perceptions contribute to risk and protection for emotional disorders. Areas of interest have been mostly investigated singularly (e.g., Ainsworth, 1978; Bowlby, 1969, 1973, 1980; Kagan, 1997) and in dyads (e.g., child temperament and attachment, Manassis & Bradley, 1994; child temperament and parent vulnerabilities; Rubin & Mills, 1991; perceived control and disorder development, Weisz, Southam-Gerow, McCarty, 2001; family environment and control beliefs, Schneewind, 1995). These important research topics have been assembled together and related to an aetiological theory of distress disorders in children conceptualised by Chorpita and Barlow (1998; Barlow, 2000, 2002; Chorpita, 2001) and tested in a limited way by Chorpita, Brown and Barlow (1998).

This research has been aided by the development of measures that more accurately assess perceptions of control in specific domains as well as measures that more specifically reflect research understanding about what constitutes adversity (e.g., psychologically controlling and/or rejecting parenting; conflicting, incohesive family environment). Further aiding this investigation are several other developments. For example, the complex, dynamic, multi-transactional perspective of developmental psychopathology has been found to be useful for studying psychological disorders in children (Cicchetti & Cohen, 1995) and more interest has been generated for the study of emotion (Barlow, 2000; Vasey & Dadds, 2001). Clinicians have found that a focus on family as well as individual distress factors in treatment, have made treatment effects potentially more sustainable (Kendall et al., 1997). Such advances suggest that studying the relationship between family characteristics and distress is likely to facilitate identification, treatment and prevention. Additionally, social science research has begun to

make better use of causal modelling which can assist in the understanding of more complex multi-component relationships.

#### **11.1.1.1. Assessment of an Interactive Biopsychosocial Model of Distress in Children**

Although several theorists have emphasised the necessity for integrating biological, environmental and cognitive factors related to the development of distress in children (Chorpita & Barlow, 1998; Greenberg, 1999; Manassis & Brady, 1994; Rubin & Mills, 1991; Vasey & Dadds, 2001), very few researchers have actually attempted to do so, particularly using a structural modelling framework. Furthermore, attempts to understand relationships between parenting styles, family conditions and distress have suffered from methodological limitations (Rapee, 1997; e.g., retrospective accounts with the problem of memory bias; accounts which have been limited to perceptions; laboratory observations which may suffer from inaccuracies of inference and other uncontrollable factors like parental anxiety at being watched) have made information hard to interpret. In defence of self-report, Neal and Edelman (2003) argue that perceptions are of greater importance than actual observations as perceptions are based on an accumulation of subtleties that ultimately affects how the person thinks and feels. Barlow's theory supports such a contention and the present study includes the child's perceptions of parenting, family environment and control and competence as central to the theory and study. Such research has yet to be done with other than primarily clinical populations. Reliable and theoretically meaningful models generated from a school population sample would advance the field to include normal developmental processes, thus adding weight to the clinical findings and to their value for intervention designs. As mentioned, previous studies of distress disorder aetiology have generally been approached through downward extension of adult theories and have not considered developmental issues or the complexity of the field. Also, research has tended to rely on correlational techniques and focus on single factors operating in isolation (Vasey & Dadds, 2001). Hence, an

empirical exploration of the interrelationships between temperamental, environmental and cognitive factors with a school sample and using an assessable structural model is now needed.

### **11.1.2. Issues in Need of Examination**

The primary aim of the present study was to assess and explore in more detail a biopsychosocial mediational model of the aetiology of anxiety and related disorders in children developed by Chorpita and Barlow (1998; Barlow, 2000, 2002; Chorpita, 2001). This model was tested by Chorpita, Brown and Barlow, (1998) on a small ( $n = 93$ ) mixed clinical ( $n = 62$ ) and nonclinical ( $n = 31$ ) sample of children and their parents from generally middle-class homes. There were an equal number of boys and girls and children ranged in age from 6 to 15 (mean age 11.15 years). The clinical group were chosen from consecutive referrals to a clinic which specialised in childhood anxiety disorders and were included if the child displayed a principal or co-principal diagnosis of anxiety disorder or a particular mood disorder (i.e., dysthymia or major depression) according to *DSM-IV* criteria (American Psychiatric Association, 1994) established using the Anxiety Disorders Interview Schedule for *DSM-IV* Child and Parent Versions (ADIS-IV C/P; Silverman & Albano, 1996 cited in Chorpita et al., 1998). Those with conduct disorder, psychotic disorders, developmental disorders and retardation were excluded from the sample. The nonclinical sample, whose children matched the age-range of the clinical sample, was recruited through advertisement and children assessed using the ADIS-IV-C/P. All children in the nonclinical group (aside from one who was added to the clinical group) were assigned no diagnosis. While children and both parents, if they were present, completed the battery of measures, only the child and most involved parent's scores were used in the study. Included in the study were a Control in the Family factor derived from the control subscale scores of child- and parent-report from the Family Environment Scale (FES; Moos, 1981); a Locus of Control factor from a total score from the Nowicki-

Strickland Locus of Control Scale (NSLOC; Nowicki & Strickland, 1973); an Attribution Style factor from a total score of the Children's Attributional Style Questionnaire (CASQ; Kaslow, Tanenbaum & Seligman, 1978 cited in Chorpita, Brown et al., 1998); a criterion, Negative Affect factor comprised of total scores of the child-reported RCMAS and CDI and parent-reported Child Behaviour Checklist (CBCL; Achenbach, 1991, cited in Chorpita, Brown et al., 1998). Another factor included was a clinician's rating of clinical severity separately derived from the child and parent interview, labelled Clinical Symptoms. These factors were put together using SEM and assessed for fit. Attribution style, hypothesised to be a mediator between Family Control and Negative Affect, was eliminated from the model as a mediation effect was not observed. The model was respecified and assessed and LOC was found to fully mediate the relationship between Control in the Family and Negative Affect and to explain 27% of the variance in Negative Affect.

Although their study found locus of control to mediate the relationship between control in the family and anxiety and depressive disorder development, the authors discussed a number of limitations to the study. First, they considered their measure of perceived control (i.e., locus of control) to be 'simplified' (p. 473) as it was defined too broadly as a child's belief in how much their life outcomes were potentially affected by their own behaviour as opposed to the behaviour of others. They suggested a more domain-specific measure may elicit more information related to distress. They also suggested "improved measurement of the constructs" and "refinement of the constructs" (p. 473) which they saw as coming from a greater understanding of the structural relationships to other variables. The researchers suggested that further understanding would also come from the use of more diverse and larger samples. A further improvement to the model would be the inclusion of a measure of child temperamental vulnerability which forms part of Barlow's theory (e.g., 2000, 2002; see also Chorpita, 2001).

## **11.2. Tools To Examine the Models**

Both a test for mediation and structural equation modelling (SEM) techniques were used as tools to examine the model of distress development proposed. While SEM techniques assess how variables relate to their measured variables and to each other, the test for mediation determines how the cognitive and risk factors inter-relate within the overall structural model.

### **11.2.1. Baron and Kenny's Test for a Mediator Factor or Variable**

A mediator specifies how (or is the mechanism by which) a given effect occurs (Baron & Kenny, 1986). More specifically, the independent variable(s) (IV) influence the mediator which in turn influences the dependent variables (DV). For mediation to exist, three conditions need to be met. First, the IV (e.g., child's perceived family environment) must be significantly associated with the hypothesised mediator (e.g., child's perception of their personal control); second, the hypothesised mediator must be significantly associated with the DV (e.g., anxious and depressed symptoms). Finally, the impact of the IV on the DV must be diminished after controlling for the hypothesised mediator. Using a series of regression equations, these conditions are tested. This involves: (1) a regression of the mediator on the independent variable; (2) a regression of the dependent variable on the independent variable and (3) a regression of the dependent variable on both the independent variable and the mediator. If the path between the IV and the DV becomes insignificant in step (2) and then becomes significant and stronger in step (3), then the conditions for a full mediating relationship have been fulfilled. If, in step (2), the path between the IV and the DV remains significant but becomes stronger and more significant in step (3), the conditions are met for partial mediation. If step

(3) yields a nonsignificant or reduced result, there is no mediation effect considered to be present.

### **11.2.2. Structural Equation Modelling to Construct and Assess Models**

SEM (Amos 4, Arbuckle & Wothke, 1999) was selected as a method of model-testing in the present study because of its ability to assess the adequacy of the theorised model and compare it with competing models. Also considered was the ability of SEM to estimate many parameters simultaneously while the variance of each effect is controlled for – a clear advantage over multiple regression.

Structural Equation Modelling includes a number of statistical techniques that facilitate the examination of relationships between a number of independent and dependent variables. Also referred to as covariance structure analysis, latent variable analysis, causal analysis or simultaneous equation modelling (Fergusson, 1995), SEM can be described as a combination of factor analysis (i.e., principal axis factoring) and regression or path analysis (Hair, Anderson, Tatham & Black, 1998). A series of separate latent variables are defined by a number of observed variables or indicators (i.e., a series of multiple regressions) in order to build and test a theoretical model and compare it with other competing models. By convention, latent variables are capitalised while observed variables are not. SEM differs from other multivariate techniques in its ability to estimate complex relationships between both observed and unobserved concepts while accounting for measurement error in the process of estimation (Ullman, 2001). It is a confirmatory technique more than an exploratory factor analysis in that the researcher from theory hypothesises the relationships among variables and determines how well these hypothesised relationships fit the data. In contrast to principal component analysis, confirmatory factor analysis (CFA) used in the SEM measurement model can

specify a model where each indicator loads on only one factor and then test whether that loading is plausible. Exploratory factor analysis can only approximate such structures by rotation and has the disadvantage of factor intercorrelations being strongly influenced by the specific, various rotation methods (Hox & Bechger, 2000).

A model that has been corroborated by the data may only be proven not to be false (i.e., the model can not be rejected), rather than being proven to be true. This is because, depending on the complexity of the model, many competing models, statistically, have the ability to fit the data. This is why modifications of the model, especially intercorrelations, must be guided by theory in order to be accepted as a possible solution. Although SEM techniques have the ability to modify models to create better fitting statistics, models that have to be modified too much (i.e., generally no more than 4 intercorrelations, University of Texas SEM tutorial, 2001) risk problems with generalisability (though generalisability is, in any case, limited to the type of sample used) and compatibility with underlying theory (Ullman, 2001). More recent thought has suggested that models are only approximations and therefore fit indices are to be used as a guide to fit rather than as a means of rejecting models that are close but do not quite meet cut-off criteria for acceptable fit (Hox & Bechger, 2000). Therefore, it has been suggested (Hox & Bechger, 2000) that the object of model assessment may be to examine how well the given model approximates the true model by paying more attention to the fit index which performs this function (i.e., RMSEA; Root Mean Square Error of Approximation; Steiger, 1990) than to the other fit indices that are sensitive to parsimony and sample size.

Other fit indices are available which perform differing functions and have varying sensitivity to artifactual influences like sample size and model complexity. The Goodness-of-Fit Index (GFI; Joreskog & Sorbom, 1993) assesses overall fit while the Comparative Fit Index (CFI; Bentler, 1990)

compares the model being assessed against a null model or independent model which assumes all latent variables in the model are uncorrelated. Both of these indices are affected by model complexity and sample size, generally rewarding parsimony and larger samples. Values of .9 are usually required not to reject a model while values of .95 and above are required to judge the model fit to be good. The RMSEA is less vulnerable to sample size and model complexity influences than the GFI or CFI. RMSEA values of less than .06 indicate acceptability of fit (Hu & Bentler, 1999). Also accompanying this index is the inferential test for close fit of the RMSEA called the *pclose*. Acceptable fit for this index is a value greater than .05, so values closer to 1 indicate closer fit. The Akaike's Information Criterion (AIC; Akaike, 1987) is a test of model comparison. It can be used to compare both nested (models containing the same constructs but differing in the nature of the causal relationships) and nonnested models (with different constructs). Lower values indicate better model fit. This index also rewards parsimony.

Researchers have been criticised for applying SEM techniques without adequate understanding of the limitations of the technique (Kazantzis, Ronan & Deane, 2001; Schumacker & Lomax, 1996). Major criticisms have been the use of this confirmatory technique to do exclusively exploratory research with the danger of Type I error and the attribution of causality to a statistical technique when causality can only be addressed by a longitudinal or experimental research design (Kazantzis et al., 2001; Ullman, 2001).

A number of researchers have suggested a two-step rather than a one-step method of conducting SEM when a model is not extremely robust in theory or in the reliability of measures used (e.g., Anderson & Gerbing, 1988, 1990; Mulaik et al., 1989; Williams & Hazer, 1986). This method first estimates the measurement model through confirmatory factor analysis (i.e., all latent variables allowed to be freely intercorrelated) and then the measurement model is "fixed" in order to estimate the structural model

(Anderson & Gerbing, 1988; Mulaik et al., 1989). The measurement model specifies the relationship between the latent variables and their indicators (observed variables) to confirm that the indicators reliably and validly represent the meaning of the latent variable. The indicator with the highest loading is called the marker variable as its definition lends more meaning than the others to the latent variable. The structural model specifies the relationships between the latent variables to determine whether they fit with the theory proposed by the researcher. By specifying each model separately rather than in one step, it is reasoned that the interaction effects between within-construct estimates (measurement model) and between-construct estimates (structural model) can be reduced (Anderson & Gerbing, 1988). Furthermore, if the indicators are not able to represent the constructs adequately (i.e., not able to account for substantial variance in the latent variable), it would be difficult to determine what the structural model was measuring. For these reasons, the two-step strategy was employed for the present study.

In summary, building and assessing a risk model using SEM has several advantages. SEM allows the researcher to specify and test different theoretical hypotheses and compare them with models from competing theoretical perspectives. SEM also allows for the examination of subcomponents and their relationships within the latent variables while also assessing the structural relationships between multiple latent variables simultaneously. For these reasons, structural modelling was considered to be particularly appropriate for specifying and assessing a biopsychosocial model of risk for anxiety and depression in middle childhood.

### **11.3. Model Building**

Three models were built for this study; the first, a replication of a study and its preliminary model; the second, a replication of the two main components of Barlow's theory; and the third, a number of variations of an expanded

biopsychosocial theory. For the third model, factor analysis of the predictor variables was also employed.

### **11.3.1. Model 1: Replicating Chorpita, Brown and Barlow's (1998) Model**

Considering the limitations of Chorpita et al.'s (1998) study (see Section 11.1.2.), there was a need to first re-examine the findings using more precise, but valid domain-specific measures (see Figure 11.1). Hence, the first task was to test Chorpita, Brown and Barlow's (1998) hypothesis that child-perceived control was a mediator between a child reported controlling family environment and child-perceived anxiety and depressive symptoms and parent-reported child emotional behaviour with the modifications recommended by Chorpita et al. (1998). These include: a general population sample; more precise domain-specific measures of perceived control and more specific family environment constructs in keeping with the theoretical model (Barlow, 2002; Chorpita, 2001). The central component of perceived control defined as a child's sense of having control in different domains (e.g., emotional, attachment, academic, social; Weisz, 1990; Thurber & Sigman, 1998) was used here rather than the more limited locus of control measure used by Chorpita et al. (1998). Barlow (2002) reported the idea behind the Weisz and Thurber measures to be more conceptually compatible with his theory.

Additionally, this replication included a more precise measure of parental control than the FES control scale (defined as "the extent to which set rules and procedures are used to run family life"; Moos, 1981, p. 2) used by Chorpita et al. The alternative measure contained representations of parental psychological control and rejection which have been seen to be related to distress in children (e.g., Barber, 2002; Siqueland, Kendall & Steinberg, 1996; see also Rapee, 1997 for review). The FES control scale used by Chorpita et al. was conceptually more like behavioural control which

has been found to be less related to distress in children (Barber, 2002; Rapee, 1997; Siqueland et al., 1996). In fact, authoritative parenting and behavioural control were found to be negatively related to distress by some (Barber, 2002) and weakly associated with anxiety in children (CRPBI firm vs. lax control subscale, Siqueland et al., 1996). It was predicted that the more differentiated measure of perceived control used in the following study would mediate the relationship between environmental adversity and self-reported anxious and depressed symptoms and parent-reported emotional behaviours.

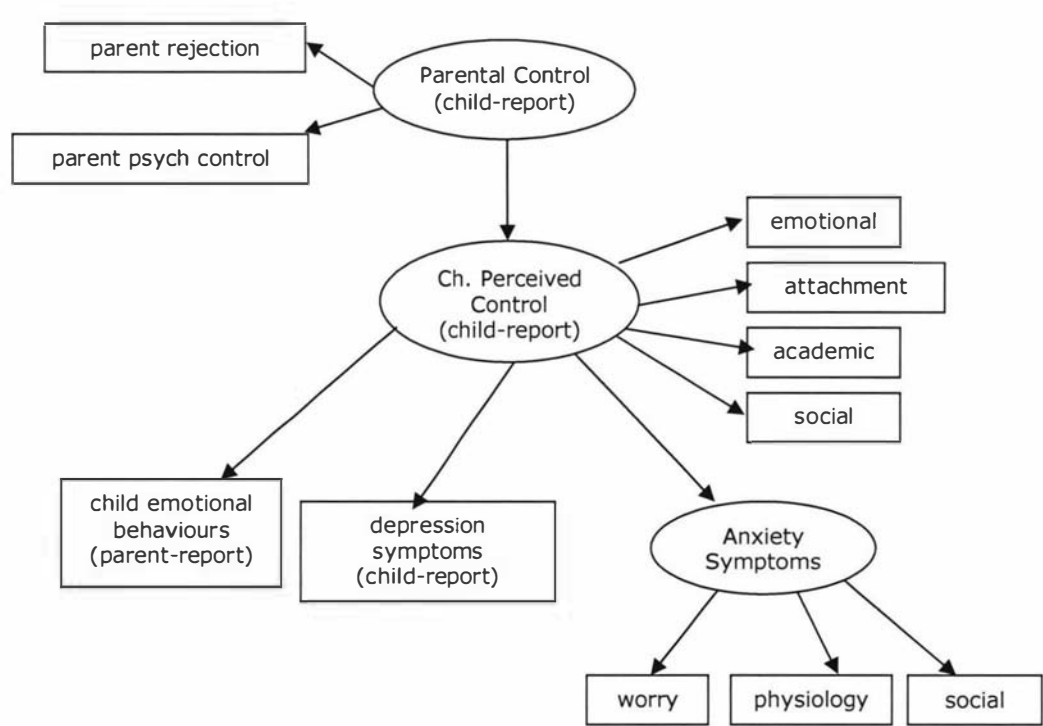


Figure 0.1. Hypothesised Replicated Mediation Model.

**11.3.2. Model 2: Expanding Replication to include General Biological Vulnerability**

Barlow’s aetiological model (Chorpita & Barlow, 1998) of distress development includes a General Biological Vulnerability component as well as a General Psychological Vulnerability. Large amounts of research have linked the biological component of child temperamental vulnerability to later

negative affect (see Chapter 5). Hence, a further replication included a second model which incorporated a child temperamental vulnerability of emotionality and shyness. This addition reflected the generalised biological vulnerability component of the theory and is also reflective of the theories of Buss and Plomin (1984) and of Kagan (1997). It was predicted that this factor would relate to both parenting style and distress and perceived control would still perform a mediating role when child temperament was included in the model (see Figure 11.2).

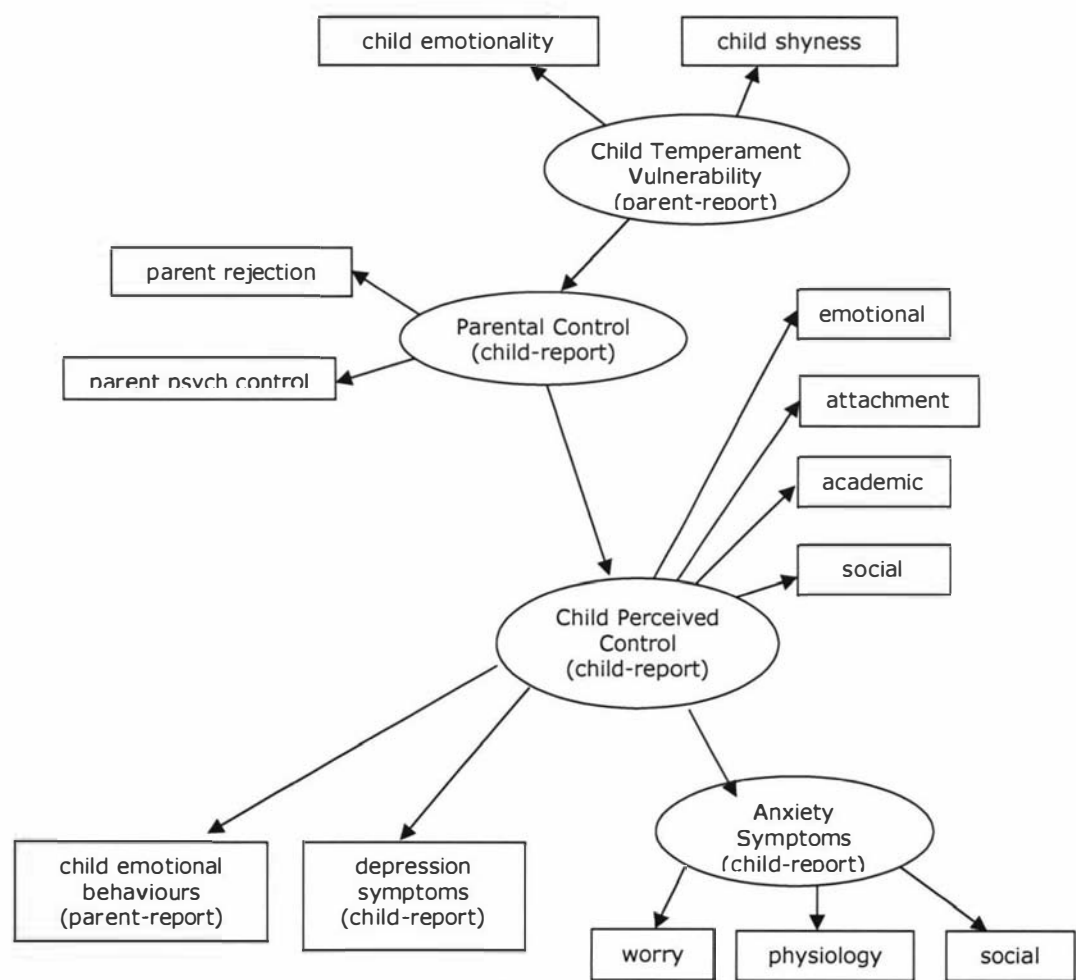


Figure 0.2. Two Vulnerabilities of Barlow's Theoretical Model.

**11.3.3. Consolidation of the Predictor Variables**

Before assessing the overall biopsychosocial model of distress development using SEM, it was necessary to group the predictor variables into

theoretically and empirically viable risk factor clusters. The discussion here, of necessity, is presented *aposteriori*. While univariate analysis confirmed that the individual variables related appropriately to each other, subscales of the predictor variables which showed both theoretical and statistical promise underwent a principal factor analysis to determine whether they grouped together according to theory. Principal factor analysis (FA; using Principal Axis Factoring from SPSS 11.0) was chosen over the more well-known principal component analysis (PCA) because it was the preferred method for seeking a theoretical solution “uncontaminated by unique and error variability” (Tabachnick & Fidell, 2000, pp. 611). In other words, while PCA is basically a data reduction tool where all variance in the components is included in the solution, FA, like CFA, is based on the principle that there is error involved in each component. Thus FA was considered a good first step to theoretically and empirically cluster the risk factors before confirming this solution using CFA. In addition to the child temperamental vulnerability factor described in the previous model and an individual parent vulnerability factor, consisting of parental fear, anger, attachment security and anxiety mentioned in Section 11.3.4., two other factors emerged.

These were two multiple indicator family environment vulnerability factors, encompassing subscales of a global family environment measure and the parenting measure used in the replication as well as a single item score of child attachment security. The first of these factors, labelled Family Control, included characteristics of a psychologically controlling, enmeshed, conflicting and less secure family environment; the other, labelled Lack of Family Support, included characteristics of a rejecting, non-cohesive, unsociable family environment where decisions were not made democratically. With six predictor factors, one criterion factor of child-reported anxiety and two indicator variables of child-reported depressive symptoms and parent-reported child emotional behaviours, it was possible to specify and assess the overall model and additional subcomponent models which included other theories relevant to the development of distress.

#### **11.3.4. Model 3: Hypothetical Model Including Other Related Theories**

In the final model to be specified and fitted, three further theoretically compatible components were added to the previous model (see Figure 11.3). First, a parent individual vulnerabilities factor which reflected attachment theory (Bowlby, 1969); social interaction theory (Manassis & Bradley, 1994; Rubin and Mills, 1991) and biological theory (Buss & Plomin, 1984) was added. Second, from factor analysis, the two multiple indicator theoretically and empirically viable family environmental vulnerability factors discussed in Section 11.3.3 were added. Despite the suggestion that specificity is not served by the use of global family environment variables (Cole & McPherson, 1993), global perceptions of family environment have been able to differentiate between distressed and nondistressed children in middle childhood (e.g., Stark et al., 1990). These two family factors were examined both separately and together in order to determine how they affected the criterion variables of distress. Third, the model assessed the theory and research of Weisz (1986, 1990) who suggested that the perceived control construct was not only related to a number of domains but its components of perceived control and perceived competence were thought to be especially related to distress in middle childhood (see Section 10.7.2. for details). For all models assessed, it was hypothesised that the cognitive constructs of perceived control and perceived competence would mediate the relationship between the biological and environmental vulnerabilities and anxiety and depressive symptoms with the present study's middle childhood sample.

#### **11.3.5. Operationalising the Hypothesised Models**

To summarise, the theoretical model (e.g., Barlow, 2000, 2002; Chorpita, 2001) suggests that anxiety and depression in children result from a

combination of biological (child emotionality and shyness) and early general environmental risk factors (parent personal vulnerabilities and early family risk factors). These vulnerabilities, accompanied by a child's perception of diminished control, are thought to increase risk. Barlow's model suggests that this combination of biological, general psychological and cognitive vulnerabilities is further influenced by specific stressful events to determine the particular form the disorder will take (e.g., accumulated social evaluative concerns relating to future social phobia). Because of the absence of specific psychological vulnerability data and because a cross-sectional research design was employed, this third component, labelled Specific Psychological Vulnerability was not investigated in the present study.

The present study did however more fully elaborate on the first two components of Barlow's model by incorporating parent vulnerabilities as suggested by Rubin and Mills (1991); child temperamental emotionality and shyness as suggested by Buss and Plomin (1984; also Kagan, 1997; Manassis & Bradley, 1994); perceived control and perceived competence (Weisz, 1990; Thurber & Sigman, 1998) and psychologically controlling and rejecting parenting (Barber, 2002; Siqueland et al., 1996) as well as other family environmental constructs that have been seen to be associated with the development of anxiety and mood disorders in children (Stark et al., 1990).

Research and theory reviewed in the introduction suggested ways in which these factors might be related (see Figure 11.3). Parent report of their Parental Vulnerabilities may lead directly to parental report of their Child's Temperamental Vulnerabilities (e.g., Rubin & Mills, 1991; Manassis & Bradley, 1994). Child Temperament may then predict the child's perception of Family Control which may predict their perception of Lack of Family Support (e.g., Barlow, 2002; Plomin & Caspi, 1999). These perceptions of their family environment would predict the child's Perceived Control which would predict the child's Perceived Competence (Barlow, 2002; Schneewind,

1995) and lead to their report of Anxiety Symptoms, depressive symptoms and their parent's report of child emotional behaviours (Barlow, 2002; Weisz, 1990). These hypothesised relationships are illustrated in Figure 11.3.

In the final model, the confirmatory nature of the study was preserved with the specification of the number of factors *a priori* where subscales clustered in a predictable way according to theory (Bollen, 2002). Specifically, this third model included four multifaceted constructs; namely, the two family environment components and the two cognitive constructs. Each of these was composed of auxiliary concepts, each of which could be distinguished conceptually from the other and measured separately, despite being related to each other both conceptually and empirically. The child-perceived family environment constructs were each comprised of subscales of a specific parenting measure of psychological control and rejection and subscales of a general family environment measure in addition to a measure of attachment-related security. As they clustered through factor analysis, one factor (Family Control) appeared to represent more observable limits in the family like conflict, parental psychological control and enmeshment, while the other (Lack of Family Support) represented less directly controlling, but nevertheless limiting, family components like lack of cohesion, parental rejection, lack of democratic decision-making and lack of sociability. The cognitive components were composed of measures of Perceived Control and Perceived Competence which combined to more fully explain control perceptions in middle childhood, but also could be considered to be theoretically and empirically separate. While combining constructs into categories simplifies data analysis and makes explanations of findings more straightforward, not analysing these components separately may lead to loss of information. Carver (1989) suggested that assessing each component separately in addition to putting them together would allow for the understanding of how individual parts related to criterion measures as well as how together they associated with outcomes.

To this end, the third model was specified and evaluated in several ways. These individual models can be seen in Chapter 13 (Figures 13.3 to 13.11) although the constructs of the overall model are illustrated in Figure 11.3. The first set of variations explored the effect of the cognitive constructs separately in the model (13.3, 13.4). The second set of variations explored the effect of the two family constructs in the model (13.5, 13.6). The third set of variations explored how the individual family constructs and individual cognitive constructs affected the model (13.7, 13.8; 13.9, 13.10). Lastly, because of their varying effects on the model and criterion variables, all components were combined in a single model (similar to Figure 11.3) which was then compared with a theoretically viable alternative model.

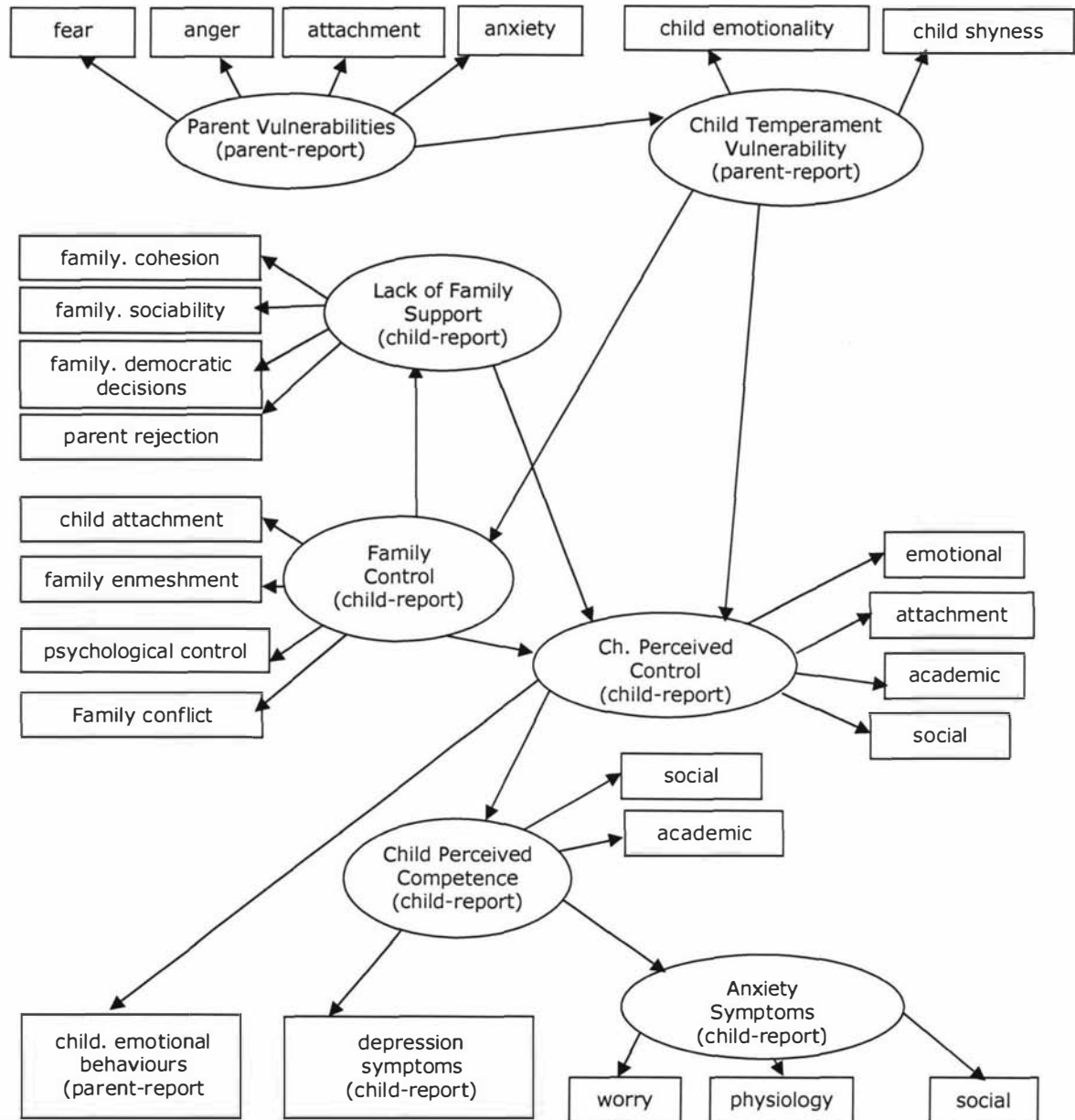


Figure 0.3 Hypothesised Theoretical Model of Anxiety and Depression Development With All Possible Variables.

11.4. Hypotheses

As discussed, three models were specified and assessed: 1) a replication of Chorpita, Brown and Barlow’s (1998) study using more specific measures and other enhancements; 2) the replication with the addition of a parent-reported child temperamental vulnerability suggested by Chorpita and Barlow (1998); 3) a further elaboration of the biopsychosocial risk model that included: additional areas of child-reported family environmental

vulnerability represented by the two latent variables of Family Control and Lack of Family Support, the addition of parent-reported Parent Vulnerabilities and the addition of a child's perception of competence commensurate with Weisz's definition of perceived control.

It was hypothesised that:

1. From the first model, a child's perception of control would mediate the relationship between parental control and anxious and depressed symptoms and parental perceptions of emotional behaviours in their child. As a corollary, it was hypothesised that a child's perceptions of control would also mediate the relationship between parental perceptions of parental control and child perceptions of their distress.
2. From the second model, a child's perception of control would continue to mediate the relationship between adversity and distress and parent perceptions of their emotional behaviours. It was also hypothesised that the addition of child temperamental vulnerability would make for a better fitting model according to fit indices and account for more variance in anxious and depressed symptoms than would the previous model. Further, it was hypothesised, as predicted by Barlow's theory, that child perceptions of parental control (psychological vulnerability) would mediate the relationship between child temperament (biological vulnerability) and child-reported anxious and depressed symptoms.

From the third model:

3. A child's perception of control and perception of competence would again mediate the relationship between risk and distress and parent-perceived emotional behaviours.
4. A parent's perception of their child's temperamental vulnerabilities would predict the child's perception of their family's control (Family Control with indicators of parental psychological control, child

attachment insecurity, family conflict and family enmeshment) and the amount of support they perceive in their family (Lack of Family Support with indicators of parental rejection, lack of cohesion, lack of democratic decision-making and lack of sociability) which in turn would relate to control perceptions and to symptoms of anxiety and depression.

5. The child's perception of competence would account for more variance in anxiety and depressive symptoms than would the child's perceptions of control.
6. The child's perception of Family Control would account for more variance in the criterion variables than would the child's perception of Lack of Family Support.
7. When a theoretically plausible competing model where all risks related independently to distress symptoms was specified and assessed, it was predicted that the competing model would not fit the data as well as the final proposed model.

### **11.5. Chapter Summary**

In summary, the present study draws on theory and research in the areas of temperament, attachment, social interaction, parenting, family and cognitive perceptions to identify predictors of distress disorder development in children and to explore two parts (General Biological Vulnerability, General Psychological Vulnerability) of the triple vulnerability theory of distress disorder aetiology presented by Chorpita and Barlow (1998) and further elaborated by Barlow (2000, 2002; Chorpita, 2001). The present study examines the combined influence of child temperament, parent vulnerabilities, family factors and perceptions of control and competence on the development of distress in middle childhood. This research extends previous research in several important ways. First, attempts are made to

explain earlier findings with a different sample and more precise measures. Second, the replication model is extended to include child temperament to reflect the theory more completely. Third, the model is further extended to include more parental and family environmental risk variables and both child- and parent-report, to more effectively understand multiple biopsychosocial risks for distress. Further, more specific cognitive constructs (perceived control and perceived competence) were used. The exploration of this model is intended to facilitate a fuller understanding of the vulnerabilities facing distressed children and go some way to understanding what factors may increase risk and provide protection from the development of distress symptoms for children in middle childhood.

## **CHAPTER 12.**

### **METHOD**

#### **12.1 Chapter Overview**

The impact that a child's temperament, a parent's vulnerabilities, parenting styles, general family conditions and a child's perceived control and competence had on the development of anxiety and depression was studied in a sample of 8-11 year olds from a semi-rural area of New Zealand. Prior to conducting the present study, a pilot was conducted to refine the measurement battery used in accordance with understandings and time-frames suitable to the age range of the children. Additionally, parent feedback was sought on the length, ease of completion and understanding of their questionnaires. As a result, the battery was reduced for the children and parents and instructions were made clearer for the parents.

There were three phases involved in the present study. Phase 1 included sample recruitment. Phase 2 included data collection over a two month period. This entailed administering questionnaires to the children with the assistance of two helpers and posting questionnaires to a child's most involved parent on the day that child participated. Phase 3 was the data analysis.

This chapter describes the demographics of subjects, measures used and the procedures that were followed for recruiting subjects, administering questionnaires and maintaining data integrity. In addition, the research design and the statistical methods that were employed to analyse the data are briefly recapped (fuller descriptions in Chapter 11 and Chapter 13).

**12.2 Participants**

Of the 311 child-parent dyads who agreed to complete the measures, fifteen participant dyads were removed from data analysis due to more than 50% missing data (Hair, Anderson, Tatham & Black, 1998). A further three cases were eliminated because of multivariate outliers (analysed using Mahalanobis Distance as well as additional analysis from SEM output) leaving 293 research participants. The demographics of the removed sample did not differ significantly from those of the sample remaining which consisted of 293 children in years 4 to 6 from nine primary schools in a semi-rural area of the South Island of New Zealand and their primary parent or caregiver. The demographic information for this sample is presented in Table 12.1. This child sample consisted of 132 males and 161 females between 8 and 11 years with an average age of approximately nine ( $M = 9.25$ ,  $SD = .98$ ). Girls ( $M = 9.2$ ,  $SD .98$ ) in the sample were slightly younger than the boys ( $M = 9.3$ ,  $SD 1.00$ ).

The caregiver sample also totalled 293 and was composed of 274 mothers with a mean age of 37.58 ( $SD = 4.98$ ), including 2 adoptive mothers (mean age =38.5) and 3 foster mothers (mean age = 47.3) and 19 fathers with a mean age of 40.19 ( $SD = 5.69$ ), including 1 step-father (aged 36). Annual incomes between 15,000 and 30,000 were reported by 27.7% ( $n=81$ ) of the sample with 47.7% ( $n=140$ ) between 30,000 and 60,000 dollars and 18.8% ( $n=55$ ) over 60,000 dollars. Only 5.8% ( $n=17$ ) of the sample reported income levels below 15,000 dollars. Regarding living arrangements, 69.6% ( $n=205$ ) of the children lived with two parents, while 28.7% ( $n=84$ ) lived with a single parent (27.2%,  $n=80$  with mother only; 1.4%,  $n=4$  with father only); 8% ( $n=2$ ) lived with each parent half of the time and 1% ( $n=3$ ) with foster parents. The majority of the sample were qualified educationally with 38.2% ( $n = 112$ ) of adult respondents having a tertiary qualification or beyond; 60.4% ( $n=177$ ) having a secondary school qualification and 1.4% ( $n=4$ ) having completed primary school only. The greatest percentage of

caregivers worked part-time within school hours (31.7%), while 22.9% worked part-time outside of school hours, 16.7% worked full time and 28.7% did not work outside of the home.

Ethnicity was determined from a question on the demographic self-report questionnaire for caregivers where they were asked to select to which of several ethnic origins they and their child related. Choices were presented in alphabetical order as Asian, European, Indian, New Zealand Māori, New Zealand European, Pacific Islander and Other. Other combinations endorsed were various mixes of the individual groups.

Ethnicity reported by the parents for the child sample was 83.6% New Zealand European or European (n=245), 5% Māori (n=15); 8% Māori/European (n=23); 1.7% Pacific Island (n=5) and 1.7% 'Other', which consisted of various combinations of Asian, Indian, Māori and European extraction (n=5). Parent respondents endorsed similar origins with 86% endorsing New Zealand, European or a combination (n=252); 5% Māori (n=15); 7% Māori/European (n=20); 3% Pacific Island (n=1) while 1.7% endorsing the 'Other' category (n=5).

Table 12.1

**Demographic Characteristics of Study Participants**

	Caregivers		Children	
	M	SD	M	SD
Mean Age				
Male	40.2	5.7	9.3	1.0
Female	37.6	5.0	9.2	.98
	n	%	n	%
Gender				
Male	19	6.5	132	45.1
Female	274	93.5	161	54.9
Family Structure				
Two parent	204	69.6		
Single parent	84	28.7		
Other	5	1.7		
Income				
Under 15,000	17	5.8		
15,000-30,000	81	27.7		
30,000-60,000	140	47.7		
Over 60,000	55	18.8		
Ethnicity				
NZ Euro/Euro	252	86.0	245	83.6
Māori	15	5.0	15	5.0
Māori/Euro	20	7.0	23	8.0
Pacific Islander	1	0.3	5	1.7
Other	5	1.7	5	1.7

**12.3 Measures**

Participants were assessed with a battery of self-report and parent measures. Reliability and validity for most of the measures in the battery has been well established, however New Zealand norms are not currently available for most measures. Where these are available, they are presented in this section. While child measures were administered by the researcher at the school, parents completed their questionnaires and returned them to the researcher by mail.

### **12.3.1 Child Self-Report Measures**

#### **12.3.1.1 Measures of Negative Affect**

Revised Children's Manifest Anxiety Schedule (RCMAS; Reynolds & Richmond, 1985). The RCMAS is a widely used and well-researched 37-item self-report measure designed to assess chronic anxiety states in children 5-19 years. Twenty-eight items are summed from 'yes' or 'no' responses to yield a Total Anxiety score. Each item is scored with a zero or one with the range for the Total Anxiety scale being between 0 and 28. The RCMAS also yields three factor sub-scales: worry/oversensitivity (11 items), physiological anxiety (10 items) and concentration/social anxiety (7 items). The other nine items comprise the social desirability or "lie" sub-scale. The RCMAS is constructed such that the total anxiety score can be converted into a T score with a mean of 50 and a standard deviation of 10. Normative data are available by age, race and sex, based on a large standardisation school sample (Reynolds & Richmond, 1985). Evidence of internal consistency, as well as test-retest reliability has been reported (Reynolds & Richmond, 1985; Reynolds & Paget, 1983). Alpha reliabilities using the present sample were as follows: full scale .86; worry .82; physiological .68; and concentration/social .73. Alpha for the lie scale was .72.

RCMAS has demonstrated adequate concurrent and discriminate validity. It is highly correlated with the STAIC trait scale yet is marginally correlated with the STAIC state scale (Reynolds, 1980, 1982, 1985 cited in Reynolds & Richmond, 1985). Construct validity has been shown in factor analytic studies (e.g., Finch, Kendall & Montgomery, 1974; Reynolds & Richmond, 1979).

Child Depression Inventory-Short Form (CDI-S; Kovacs, 1992) The CDI-S is a 10-item measure that was developed using the normative sample data from the original 27-item CDI (Kovacs, 1981, 1983), to provide a psychometrically sound screening tool for child depression symptoms. Items

presented in a forced-choice format are scored from 0 to 2 with higher scores indicating increasing severity of depressive symptomatology. Items included in this form were: sadness, pessimism, self-deprecation, self-hate, crying spells, irritability, negative body image, loneliness, lack of friends and feeling unloved. In order to identify the items for use in the short form, a backwards stepwise internal consistency reliability analysis was performed so that an item, when eliminated, least decreased the alpha coefficient. This was done one item at a time until the alpha coefficient decreased significantly upon removal of another item. Second, owing to its sometimes controversial nature, the developer dropped the suicide item from the form, leaving a total of 10 items with a correlation of  $r = .89$  with the full inventory. Its alpha reliability coefficient of .80 indicates an acceptable approximation to the overall content of the full CDI (Kovacs, 1992). Scoring of this form requires the raw scores to be transformed into T-scores with scores above 6 being considered problematic. This method provides a cut-off for use with a normal population (raw score of 7 for 8 – 12 year olds; Kovacs, 1992) comparable to the suggested cut-off for the full CDI measure (Nolen-Hoeksema, Seligman & Girgus, 1986; Smucker, Craighead, Craighead & Green, 1986). Normative data for the original measure have been established on at least two samples of preadolescent school children (Finch, Saylor & Edwards, 1985; Smucker et al., 1986). Normative data using New Zealand school samples has not differed significantly from the relevant US manual-based norms (e.g., with ages 7 to 15, Ronan, 1997). Alpha reliability for the present sample was .77 for this short measure.

Concurrent validity appears to be adequate with many studies using normal populations (e.g., 8-15 yr olds, Kovacs, 1985) reporting self-rated depression to be correlated with scores on self-esteem and other depression and social adjustment measures (e.g., Green, 1980; Kovacs, 1985; Weissman et al., 1980, all cited in Kovacs, 1992). Discriminant validity has not been well established and requires further study (Kovacs, 1992). Aside

from its reliance on solid psychometric procedures, construct validity has not been otherwise established for the CDI-S. Further research is required.

#### **12.3.1.2 Child's Relationship Measure**

Self-Report Attachment Style Prototypes-children's version (SRASP-C; Thurber, Bombar and Sigman, 1994, cited in Thurber & Sigman, 1998). The SRASP-C, adapted from the adult measure (SRASP; Bartholomew & Horowitz, 1991) assesses participants' self-perceptions of their relationship style. The adult measure is described more fully in the parent measures section. For the child measure, Thurber, Bombar and Sigman (1994) slightly simplified the wording. This measure asks participants to make a Likert scale rating (0-5) of how much each of four short paragraphs is an accurate description of themselves. The paragraphs, each read aloud twice, describe four empirically supported relationship styles: secure, preoccupied, fearful and dismissing. A composite score of self-perceived relationship security was derived by subtracting participants' endorsements of the preoccupied, fearful and dismissing paragraphs from their endorsement of the paragraph describing a secure style (see Thurber & Sigman, 1998). Thus, the higher the composite score, the more the child endorses secure interpersonal attachment. To ease understanding for younger children in the present study, descriptive anchors (very not like, mostly not like, sort of not like, sort of like, mostly like, very like) were used to anchor the numbers. Thurber and Sigman (1998) did not report alpha reliability of this single item measure. As with the adult measure that also has four discrete, single item prototypes, internal consistency was difficult to measure.

In terms of validity, Thurber and Sigman (1998) in their study of 293 boys found insecure interpersonal attitudes (as measured by low scores on the SRASP-C) as being significantly correlated with homesickness intensity as well as perceived control and depressive and anxious symptoms.

### 12.3.1.3 Child's Perception of Family Environment Measures

*The Children's Report of Parental Behaviour Inventory* (CRPBI; Schluderman & Schluderman, 1970). The CRPBI is a 30 item measure designed to assess children's perceptions of their parents' behaviour toward them. The items are scored on a 3 point Likert scale (1= not like mother or father, 2= sort of like mother or father and 3= a lot like mother or father) and result in a range of total scores between 30 and 90. The measure was reduced from the original 260 item measure (Schaefer, 1965) to a 30 item questionnaire by factor analysing data from two independent samples. This analysis yielded three 10 item subscales: psychological control vs. autonomy (PC) ('autonomy' later referred to more accurately as 'sensitivity'; Barber, 2002); acceptance vs. rejection (AC) and firm vs. lax behavioural control (FC). Replication of the factor structure, similar to that of the original version (Schaefer, 1965) and to that of a French translation of the original version (Renson, Schaefer & Levy, 1968) for varying populations suggests the possibility that this instrument may be of use with cross-cultural samples (Renson et al., 1968). Schwartz, Barton-Henry and Pruzinsky (1985) found the internal consistency of the subscales to range from .65 to .74. Siqueland, Kendall and Steinberg (1996) found adequate internal consistency for the major factors of the AC (.66) and PC (.69) subscales and lower consistency for the FC scale (.36) (Siqueland et al., 1996, prepress draft). Because of the low consistency and the need to keep the total number of items in the battery constrained to time limits, only the AC and PC subscales were used. This shortened the measure to 20 items giving a range of responses between 20 and 60. Internal consistency (alpha estimates) using current data were the same as Siqueland et al. (1996) and are as follows: AC = 0.66, PC = 0.69.

---

Convergent validity was supported by the significant correlation between child reports of psychological control and rejection and independent raters' observations of these behaviours (Siqueland et al., 1996). Barber (2002)

also reports several school-based studies where psychological control and rejection correlate with observer ratings of these behaviours. Additionally, in the present study, psychological control moderately correlated significantly with enmeshment on the SRMFF, but not with perceptions of emotional control, supporting discriminant validity. Equally, child report of parental rejection correlated moderately with lack of family cohesion, but poorly with enmeshment.

*The Self-Report Measure of Family Functioning* (SRMFF; Bloom, 1985). The SRMFF is a measure of perceived family functioning consisting of 75 items that were chosen from factor analyses of the Family Environment Scale (Moos & Moos, 1981), Family-Concept Q Sort (Van der Veen, 1965), Family Adaptability and Cohesion Evaluation Scales (Olsen, Bell & Portner, 1978) and the Family Assessment Measure (Skinner, Steinhauer, & Santa-Barbara, 1983). The measure consists of three dimensions and 15 scales, each scale consisting of five items. The Relationship dimension describes various characteristics of the relationships among family members and consists of six subscales (cohesion, expressiveness, conflict, family sociability, family idealisation and disengagement). The Value dimension describes family values and consists of three subscales (intellectual, active/recreational and moral/religious emphasis). The third dimension, System Maintenance describes the management style from the respondent's perception of who controls their lives and consists of six subscales (organisation, external locus of control, democratic family decision-making style, laissez-faire family style, authoritarian family style and enmeshment).

As a result of investigation of the psychometric properties of this instrument Stark, Humphrey, Lewis and Crook (1990) found the subscales of disengagement, external locus of control, family idealisation and laissez-faire family style to not meet minimal standards of reliability. They found through

discriminant function analysis that cohesion, conflict, democratic family style, family sociability and enmeshment accounted for 90% of the variance in children's ratings of depression and anxiety. Bloom (1996; Bloom & McNaar, 1994) found that subscales clustered together with factor analysis. The subscales of conflict, cohesion and democratic style loaded on the factor that accounted for the most variance and described intrafamilial functioning, while sociability, activity, religiosity and enmeshment clustered together on the next highest factor to describe how the family related to the outside world. As a result of both sets of findings, the present study used the subscales which discriminated between the normal and pathological groups of children in Stark et al. (1990). The resulting measure had 30 items (6 subscales with 5 items each) yielding subscale scores between 5 and 20 and a resultant total score ranging between 30 and 100. The present study also modified the original SRMFF for children (SRMFF-C) by using clearer wording for the instructions and items, taking out double negatives and changing the descriptive anchors following Stark et al. (1990). Items are scored on a 3-point Likert scale with higher subscale scores indicating greater endorsement of the construct. Respondents endorsed whether each statement as follows: 1 = never/hardly ever, 2 = sometimes, 3 = often happened for their family. For the purpose of consistency of direction in the present study, democratic family decision-making style, cohesion, family sociability subscales were reverse-scored.

Cronbach's alphas for the original research with young adults range between 0.68 and 0.85 for the subscales used in the present study (Bloom, 1985). Stark et al. (1990) reported reasonable internal consistency for the children's measure to be: cohesion (.69); conflict (.66); family sociability (.54); democratic family style (.73) and enmeshment (.51). Alphas for the present study were as follows: cohesion = .74; conflict = .61; family sociability = .67; democratic family style = .68 and enmeshment = .63.

In a retrospective study of intact and disrupted families, intact families were described as significantly more cohesive and sociable; less conflicted; and higher in democratic family style and sociability than disrupted families (Bloom, 1985). However, there were no differences found between the groups on the enmeshment scale (Bloom, 1985). Stark et al. (1990) found that both anxiety-disordered and depressed children reported their families as being more conflicted and enmeshed and less democratic in decision-making, less social and less cohesive.

#### **12.3.1.4 Child's Perceived Sense of Control and Competence**

*Perceived Control Scale* (PCS; Weisz, Proffitt & Sweeney, 1991; Thurber & Sigman, 1998). The original PCS (Weisz et al., 1991) is a 24-item self-report measure of children's perceptions of personal control in the academic, behavioural and social domains. Children rate how true each statement is for them on a 4-point scale with 1 = 'very false', 2 = 'sort of false', 3 = 'sort of true' and 4 = 'very true'. Half of the items are phrased in the positive direction, while the other half is expressed in the negative direction. Ratings are summed to produce scores for the total scale as well as three 8-item subscales: academic, behavioural and social control subscales. Higher scores indicate greater perceived control. For the purpose of the present study some words were changed to make the measure more understandable to New Zealand children (e.g., "grades" to "marks").

For a sample of 360 children aged 8 to 17 years ( $M = 11.9$ ,  $SD = 2.6$ ), internal consistency was adequate with the academic, behavioural and social control subscales having alphas of 0.88, 0.79, 0.77 and 0.73 respectively (Weisz, Southam-Gerow, McCarty, 2001). For their subsample of 161 children aged 8 to 11, internal consistency was also found to be adequate with alpha coefficients as follows: Academic .78, Behavioural .69 and Social .72 (Weisz et al., 2001). Test-retest reliability over a 6-month interval for 211 of the larger sample was  $r = 0.57$  and  $r = 0.46$  for 108 of the child

subsample (Weisz et al., 2001). Weisz et al. (2001) used SEM analysis on the full sample and separately on the subsample of children and adolescents to determine the amount of variance in depression scores that were accounted for by three measures consistent with Weisz's (1990) theory. For the adolescents and child data combined, 46% of the variance was accounted for by measures of perceived control, perceived contingency (Weisz, Proffitt & Sweeney, 1991) and competence (Harter, 1985). However, all of the variance for the children aged 8 to 11 was accounted for by the measures of perceived control and perceived competence alone. With this in mind and considering time constraints with the addition of two other relevant subscales (Thurber & Sigman, 1998), the present study used only the perceived control and competence (Harter, 1985, see next section) measures.

Thurber and Sigman (1998) created two identically constructed 8 item scales: 'perceived attachment control' (i.e., feeling able to get help when in distress) and 'perceived emotional control' (i.e., feeling in control of their feelings) which were added to the present measure. With a sample of 293 boys of 12 years, internal consistency for all five scales was adequate with alphas as follows: academic = .84; social = .83; behaviour = .82; attachment = .84 and emotions = .84 (Thurber & Sigman, 1998).

From pilot testing of 15 children, it appeared that the participants did not understand the negatively worded questions, as internal consistency for the individual subscales of the entire measure were compared with the internal consistency of the items phrased only in a positive direction. When using only the positively framed items, alphas improved for all but the emotional control subscale (academic from .17 to .71; social from .43 to .86; behavioural from .68 to .78; emotional from .84 to .75 and attachment from .64 to .80). As a result, it was decided to only include the items phrased in a positive direction for the main study (The fact that the negatively worded items had reciprocal content to the positively worded items precluded the

alternative solution of simply wording the remaining items positively). The revised measure then consisted of a total of 20 items (4 items per subscale). Internal consistency for that measure using the full sample was as follows: academic = .65, social = .73, behaviour = .61, emotional = .88, attachment = .76.

In terms of validity, the preliminary form of this measure was used as a question probes format asking outpatient and inpatient children about their ability to cause intended outcomes concerning problems at home and at school (Weisz et al., 1989). Construct validity was supported by the finding that, as per the theory, probe control scores in both samples were moderately correlated with competence. Predictive validity was supported with a clinical sample of children aged 8 to 17 (Weisz, 1986) where therapy outcomes after 6 months were significantly correlated with children's control beliefs ( $r = .41$ ) and accounted for a significant portion of the variance in improvement. Thurber and Sigman (1998) found that low perceived control using full scale scores along with insecure interpersonal attitudes (SRASP-C) significantly predicted homesickness in preadolescent boys. It was also significantly related to depressive (CDI) and anxiety symptoms (RCMAS) reported.

*Harter Self-Perception Profile for Children (SPPC, Harter, 1985b).* A revision of the 28-item Perceived Competence Scale for Children (Harter, 1982), the SPPC, was designed for children 8 years and over. It is a 36-item self-report measure of children's perceptions of personal competence and self-adequacy in the domains of academic/scholastic, behavioural conduct, social acceptance, personal appearance and athletics as well as global self-worth. For the purpose of the present study, only the 18 items from the academic, behavioural conduct and social acceptance domains were retained and have been referred to as the perceived competence scale in the present study. This same eighteen item measure has been used by Weisz and colleagues (e.g., Han, Weisz & Weiss, 2001; Weisz et al., 2001).

The questionnaire employs a structured alternative or forced choice format, where each item presents two contrasting descriptions. Respondents first choose which contrasting description is truer for them and then are asked whether that statement is "really true" or "sort of true" for them. In half of the items, the more competent option is presented first. Items are scored on a four-point scale with higher scores reflecting greater perceived competence. Scores are summed and averaged for each subscale and are then used to define a given child's profile.

The subscales show adequate internal consistency with those subscales used in the manual reporting alphas of 0.80-0.85 for academic, 0.75-0.8 for social and 0.71-0.77 for behavioural conduct (Harter, 1985b). Alphas using the present sample were as follows: academic, 0.70, social 0.74 and behavioural conduct 0.66. Test-retest reliability over a 6-month interval for a mixed clinical and nonclinical sample of 332 children, 7 to 17 years old, was  $r = 0.52$  for the academic,  $r = 0.61$  for social and  $r = 0.65$  for behavioural competence subscales (Han, 1997; Han et al., 2001).

Regarding validity, the SPPC is reported to have a highly interpretable factor structure, with each subscale defining a unique factor. Factor loading for each subscale is substantial with no cross-loadings greater than 0.18 and an average cross loading across factors to be between 0.04 and 0.08 (Harter, 1985a). Marsh and MacDonald Holmes (1990) tested the construct validity of Harter's scale using factor analysis and multi-trait, multi-method analysis and patterns of correlations with academic achievement. Results supported convergent, discriminant and criterion-related validities with factor analysis showing target loadings to be adequate and as expected.

### **12.3.2 Parent-Report Measures**

#### **12.3.2.1 Measures of Caregiver Availability**

*Adult Manifest Anxiety Scale* (AMAS, Reynolds & Richmond, 2000). The AMAS is an upward extension of the Revised Children's Manifest Anxiety Scale reported in the children's section of the measures and is a measure of chronic anxiety states in adults. Using those items on the original 100 item scale that had higher factor loadings on relevant subscales, the following 36 item measure was derived: worry/oversensitivity (14 items); physiological anxiety (9 items); life stresses (7 items); a lie scale (6 items). This shortened version had a forced choice format (yes = 1, no = 0) yielding a full scale anxiety score range between 0 and 30 and a lie scale range from 0 to 6. This version was administered in the present study with alphas for the full scale being 0.86, worry 0.80, physiological 0.76, and life stress 0.60. As this measure has not been used before, there was no validity data available.

*The EAS Temperament Survey for Adults* (Buss & Plomin, 1984). The EAS is a 20-item measure with each item rated on a 5-point scale, assessing three dimensions of temperament. Buss and Plomin (1984) have identified these dimensions through factor analysis and have defined them from their research and theory of early appearing, stable and genetically influenced characteristics. These are Emotionality, Activity and Sociability (EAS). Emotionality is further divided into distress, fearfulness and anger, thus yielding 5 scales (i.e., activity, sociability, distress, fearfulness, anger) with four items each. Scoring requires each scale total to be divided by 4 to interpret scores in terms of the 1-5 scale. Norms for males and females were obtained from a sample of 330 students (Buss & Plomin, 1984). Test-retest reliability over two weeks was between 0.75 and 0.85 for all scales. Internal consistency using the present sample was as follows: anger = 0.54, sociability = 0.76, activity = 0.65, distress = 0.81 and fear = 0.77.

Regarding validity, the EAS has been reported to have a highly interpretable factor structure with each subscale defining a unique factor when the questionnaire was administered to 330 university students (Buss & Plomin, 1975). Within the measure, factor loading for each subscale was substantial and correlated as theory predicted. Distress was moderately correlated with fearfulness (.63) and less so with anger (.37) while anger and fearfulness were not significantly correlated. As well, emotionality scales (i.e., distress, anger, fearfulness) were mostly independent of sociability and activity though there was a significant correlation between activity and anger in men. Convergent validity was demonstrated with the extraversion scale on the Maudsley Personality Inventory (Eysenck, 1959), which had sociability and emotionality items similar in nature to the EAS questionnaire being correlated .81 with the EAS full scale (Plomin, 1976).

*Self-Report Attachment Style Prototypes* (SRASP; Bartholomew & Horowitz, 1991). The SRASP is a measure to identify relationship styles in adults. Drawing on the theory of Bowlby (1973, 1980, 1982), and as a result of multi-trait, multi-method research, four prototypical relationship styles (secure, fearful, preoccupied or dismissing) were generated. The four styles are rated on a 7-point Likert scale. Participants are asked to make a rating of how much each of four short paragraphs is an accurate description of how they see themselves (i.e., each paragraph represents one of the 4 relationship styles). As with the child measure, a composite score of self-perceived relationship security was derived by subtracting participants' endorsements of the preoccupied, fearful and dismissing paragraphs from their endorsement of the paragraph describing a secure style (see Thurber & Sigman, 1998). Thus, the higher the composite score, the more the adult perceives secure interpersonal attachment. For ease of comparison in the present study, the Likert scale of the parent measure was changed from 1 - 7 to 0 - 5 to be in line with the child measure and the paragraphs were arranged in the same order as in the child measure.

A semi-structured interview developed to measure continuous and categorical ratings of the four attachment styles had an internal consistency range of between .55 and .93 for all questions (Bartholomew & Horowitz, 1991). As with the child measure that also has four discrete, single item prototypes, internal consistency was difficult to measure.

Validity was established by the positive correlation between attachment ratings and self-report measures of self-concept and interpersonal functioning consistent with a model of attachment based on the interrelationship between a person's internal model of self and their internal model of others (Bartholomew & Horowitz, 1991). Discriminant analysis correctly classified 92% of the sample (Bartholomew & Horowitz, 1991). In a second part of the same study, family and peer ratings of a particular subject were significantly correlated but were not significantly correlated with ratings of other subjects (ranging between -.40 to .01) (Ibid, 1991).

#### **12.3.2.2 Measures of Caregiver Perception of Child Temperament and Behaviour**

*The EAS Temperament Survey for Children: Parent Ratings* (EASC-P; Buss & Plomin, 1984). The EASC-P is constructed from the emotionality, activity and sociability (shyness) subscales of the Colorado Temperament Inventory (CCTI, Rowe & Plomin, 1977) and the sociability items from the EAS for Adults measure (see previous section). The EASC-P has four subscales: emotionality; activity; shyness and sociability. The subscales each include 5 items scored from 1 to 5 on a Likert scale. The subscale scores range between 5 and 25, with higher scores reflecting a greater amount of the characteristic present.

Rowe and Plomin (1977; see also, Buss & Plomin, 1984) noted that one item ("Child is very sociable") which would appear to be a sociability item, actually loaded on the shyness scale with factor analysis, as parents

appeared to interpret the item as shyness more than sociability. Means exist for males and females between 1 and 9 years (Rowe & Plomin, 1977; Buss & Plomin, 1984). Internal consistency averaged .83 and test-retest reliability was  $r = .72$  for emotionality,  $r = .80$  for activity and  $r = .58$  for sociability/shyness over 1 week for 31 children with an average age of 3.6 year (Buss & Plomin, 1984). Internal consistency using the present sample was as follows: shyness, 0.80; sociability, 0.57; activity, 0.70 and emotionality, 0.86. Only the emotionality and shyness subscales were used in the present study as they reflected the vulnerability more theoretically specific to the development of anxiety disorders. Buss and Plomin (1984) suggest that high shyness and high emotionality in young children may be the correlates of Kagan's vulnerable temperament of 'behavioural inhibition' (Kagan, 1994). A twin/family study (Saudino, McGuire, Hetherington, Reiss & Plomin (1995) using parent-report of EAS temperaments in adolescent twins, full siblings, half siblings and step siblings to assess the genetic contributions to personality found significant genetic influences on each of the dimensions of EAS temperament. Construct validity is supported by the fact that the dimensions have also been found to be relatively stable within nonclinical individuals and over time (e.g., with ages 4-13 years, Boer & Westenberg, 1994; and ages 4-8 years Rende, 1993). Anthony et al. (2002) found higher order measure constructs of Negative and Positive Temperament to demonstrate both discriminant and convergent validity with negative and positive affect consistent with the tripartite model with late adolescents. This study suggests the versatility of the measure as a measure to use with children and adolescents.

*Strengths and Difficulties Questionnaire* (SDQ; Goodman & Scott, 1997). The SDQ is a behavioural screening questionnaire that asks questions about 25 attributes, both positive and negative. There are 5 scales, each consisting of five items. The different scales look at Conduct Problems, Inattention-Hyperactivity, Emotional Symptoms, Peer Problems and Prosocial Behaviour. Scores for each scale except Prosocial are summed to

generate a Total Difficulties score (range being 0 – 40). The Prosocial Behaviour score stands alone as a strengths-based index (range being 0–10). The questionnaire is designed to be completed by parents of 4 to 16 year olds.

Adequate internal consistency was shown with this measure for parent-completed forms done with a nonclinical sample in Sweden ( $n = 900$ ): Total Score 0.76, Inattention-Hyperactivity, 0.75, Prosocial Behaviour 0.70, Emotional Symptoms 0.61, Conduct Problems 0.54, and Peer Problems 0.51 (Smedje, Broman, Hetta, & von Knorring, in press, cited in Goodman & Scott, 1999). Test-retest reliability for 15 of the Swedish sample over 2 weeks was 0.96 while for a British sample of 34 over a 3 to 4 week period, test-retest yielded intraclass correlations of 0.85 for the Total score, 0.75 for Inattention-Hyperactivity, 0.81 for Prosocial Behaviour, 0.70 for Emotional symptoms, 0.74 for Conduct Problems and 0.83 for Peer Problems (Goodman, in press cited in Goodman & Scott, 1999). Internal consistency using the current sample is as follows: full scale, 0.76; prosocial, 0.73; emotionality, 0.70; peer, 0.68; conduct, 0.41 and hyperactivity, 0.77.

When this measure was used in a study with 132 children aged 4 – 7, from psychiatric and dental clinics, the SDQ correlated favourably with the Child Behaviour Checklist (CBCL). It was able to discriminate psychiatric from dental cases (Goodman & Scott, 1999). The SDQ is reported to have comparable predictive validity to Rutter's questionnaires containing similar variables (Elander & Rutter, 1996 cited in Goodman & Scott, 1999; Goodman, 1997).

#### **12.3.2.3 Caregiver's Perception of Family Environment**

*The Children's Report of Parental Behaviour Inventory-Parent Version* (CRPBI-P; Schluderman & Schluderman, 1970). The CRPBI, described more fully earlier, was also completed by the primary caregiver in order to assess

parent's perceptions of their parenting behaviour and to compare those perceptions with those of their children. As with the child measure, two subscales consisting of 10 items each scored from 1 to 3: psychological control (PC) vs. autonomy granting or sensitivity and rejection vs. acceptance (AC). The words and descriptive anchors were changed from the child measure to be compatible with administration to their parents. Siqueland, Kendall and Steinberg (1996) found adequate internal consistency for mother's report of herself (AC, .68 and PC, .70) and father's report of himself (AC, .72 and PC, .80). Alphas reported for internal consistency using the current sample were as follows: AC, 0.60 and PC, 0.60.

## **12.4 Procedure**

### **12.4.1 Initial Procedure**

#### **12.4.1.1 Pilot**

A school principal, who was interested in this study, offered his small school as a pilot. Permission forms and explanations were included with the school newsletter sent to parents. From this, 15 parents agreed to participate in the study. The same format applied to questionnaire administration and sending questionnaires to parents as is described later for the full study except that parents and children were asked to give feedback on such things as questionnaire readability, understanding, length and appropriateness. Because there were initially more questionnaires in the battery, the process took longer. As a result of feedback from and analysis of data from the pilot, some measures were eliminated and some revised (i.e., made shorter as indicated in the measurement section). The data from this sample were integrated into the full study as there were no significant differences in mean scores between the two samples on any of the measures ( $p > .10$ ).

#### **12.4.1.2 Initial contacts**

Following feedback from the pilot study, potential participating schools, located in a semi-rural area of New Zealand, were recruited by a telephone call to the principal concerned. After initial agreement to consider participation, a formal package of materials was then sent to each of the interested schools. This package contained: a) a copy of the materials to be administered to the students and their families; b) an example of information sheets and consent forms for the parents, students and school; c) an information letter to the principal, teachers and Boards of Trustees (BOT) containing a summary of the objectives and justification for the research, what we were prepared to offer, as well as contact phone numbers of the researcher and research supervisor for queries (see Appendix A). Dependent upon principal recommendation, schools were given a week or two to review the information and consult with their BOT's before the researcher contacted the school principal again. Some principals had questions on this second contact which were answered by the researcher. Of the 15 schools initially approached, 9 principals (after consultation with each of their Boards of Trustees) agreed to participate.

Although the researcher offered to come to the school to talk with teachers, principals wanted to use their own systems to distribute parent and child information sheets and consent forms and inform teachers of the research. Principals advised the researcher of how many consent forms they required and distributed these to teachers. Most added a story about the research in their school newsletter and sent the consent forms home with this newsletter. Teachers were asked to inform the students that those who returned their signed consent forms to their teacher (whether they or their parents gave consent to the research or not), would receive a "lucky dip" prize. The parent consent forms were collected by the researcher from the office approximately two weeks after their distribution.

## **12.4.2 Administration**

### **12.4.2.1 Administration of Child Measures**

To be included in this study, 327 students returned consent forms of agreement to participate, which were signed by both caregivers and child participants. Those who participated represented 32.9 % of the eligible population contacted. Sixteen students were absent on the day of questionnaire administration, leaving a total of 311 children in the initial sample. Assessment took place over a period of two months in August/September of 2000. The number of participants was reduced further to a final 293 as a result of a) nonreturn of parent forms (  $n = 15$ ) and preliminary data analysis identifying outliers ( $n = 3$ ) discussed later (see Section 12.5.3.).

*Data integrity:* All of the participating schools donated a room to use for group administration of the child measures. Generally, a single administration required a one and a half-hour section of the school day to assess 15 to 25 children at one time. The strategy for schools where participants totalled more than 20 was for the younger students to be assessed at the beginning of the day when they were fresh and the older ones assessed later in the day. Administration was done in a vacant classroom where desks could be separated for maximum privacy. For each school, questions were read aloud by the same researcher. Children were asked to answer the questions as they followed along. Two trained research assistants (one a teacher and one a postgraduate psychology student) were there to help children who fell behind or had questions about word comprehension. As children became restless or alternatively, every twenty minutes, breaks were taken where short games were played. While the game was being played, the research assistants would go through the questionnaires to determine whether they were completed correctly, with children discretely asked by the research assistants to complete missed items before moving on. Because of the vigilance of research assistants

while the questions were being read aloud, very few items were missing and hence, very few children were approached to complete missing items.

Before measures were administered, participants were informed that: a) the research assistants were available to answer questions at any time during administration or to read questions if the children lagged behind, but that the researcher was most interested in their own answers to questions; b) if they were unsure of an answer, they should choose the option which best described them or their feelings; and c) they were asked to follow along when the researcher read out the questions—preferably with their fingers, so the assistant could tell if they were all on the same question. Lucky dip prizes were distributed at the end of the session. Those children whose parents said 'no' on the consent forms were given their prizes via their teacher, at his/her discretion, on that same day.

#### **12.4.2.2 Administration of Parent Measures**

On the same day as questionnaires were administered to the children, questionnaires were posted to parents. In a letter accompanying the questionnaire, parents were asked to try to complete the questionnaires in one sitting or at least complete an entire section of the questionnaire at a sitting and were reminded of their right to only answer questions with which they felt comfortable. They were asked to return the questionnaires within the next fortnight in the stamped/self-addressed envelope provided. They were also informed about circling the 'yes' response at the end of the demographic information if they wished to be given a summary of results at the end of the study. Parents were further informed that all of their individual answers were completely confidential, their identifying information locked away and kept only for the purposes of research. Additionally, they were informed that no findings concerning individual cases would be given out or included in the study. Also included in the correspondence was information for those parents whose forms were not returned after three

weeks. This information indicated that there would be a followed up telephone call to see if assistance was required. Those who returned the questionnaires were sent a thank you letter which included a request that they inform the researcher of a change of address for summary information purposes.

## **12.5 Design and Plan of Analysis**

### **12.5.1 Design**

The present study employed a cross-sectional design. The data were analysed with Statistical Package for the Social Sciences (SPSS 11.0) and Structural Equation Modelling (SEM) was conducted using AMOS 4 (Arbuckle, 1997). An alpha of .05 was chosen as the level of significance for this study. As elaborated upon in Chapter 11, SEM (Amos 4, Arbuckle & Wothke, 1999) was selected as a method of model-testing in the present study because of its ability to assess the adequacy of a theorised model and compare it with a competing model. Also considered was the ability of SEM to estimate many parameters simultaneously while the variance of each effect is controlled for – a clear advantage over multiple regression.

### **12.5.2 Pre-analysis Data Screening**

Before starting the analysis, the data were assessed for accuracy, completeness and normality. For accuracy, a 10% check<sup>3</sup> was performed to make sure that data entry was precise. Also, all of the ranges of totals and subtotals were assessed for out-of-range scores as a second check on accuracy of entry. Even though most of the measures were clinical measures, the ordinal nature of the data made analyses less than ideal (Hoyle, 1995). With ordinal and categorical data, the method of estimation

---

<sup>3</sup> 1. Thirty cases (approximately 10%) were checked against the questionnaires for accuracy of data entry. If data entry error existed, more cases would be checked until 30 consecutive cases were error-free. This strategy along with checking totals and subtotals for out-of-range entries helped to ensure that, as much as possible, data was accurately entered.

that is most effective is ADF (Asymptotically Distribution Free; Hoyle, 1995). However, simulation research has shown that ADF requires over 1000 participants (Chou & Bentler, 1995). Hoyle (1995) suggested that the best estimate option for smaller samples was the use of Maximum Likelihood (ML) which was employed in this study. Another problem with the measures used was that some did not have the recommended 5 or more categories to be considered acceptable with ordinal data (Chou & Bentler, 1995). It was decided to use the suggestion of Hox and Bechger (2000) to ignore the ordinal nature of the data since it was close to normal and be aware that the major consequence would be underestimation of regression weights (Hoyle, 1995).

The data were then screened for missing data. Because of the diligence of the research assistants, assessment of missing data using SPSS MVA (missing values analysis; SPSS Inc., 1997) revealed only 10 items missing completely at random from the children's data used for this study which was well below the 5% considered acceptable (Tabachnick & Fidell, 2001). Because of the small number of missing items, it was decided to systematically replace the missing values using an educated guess (Tabachnick & Fidell, 2001) by assigning a value to the item based on the average response of five other participants of the same sex and age who had similar profiles (i.e., the same three values on either side of the missing value) on the measure from which the missing item came. A comparison of mean, median and SD of those item totals with and without the replaced value revealed no difference when the averaged score was entered suggesting that the method did not compromise the integrity of the data. Parent questionnaires which were returned had complete data for the measures used in the study. There were, however, 15 parents who did not return the questionnaires after two reminders, so the data from their children were deleted from the study leaving a total of 296 parent-child pairs in the study.

Next, the data were screened for univariate outliers through SPSS frequencies and for normality through examination of histograms, skew and kurtosis statistics and random screeplots for linearity, also from SPSS frequencies and descriptives. Multivariate outliers were screened using SPSS regression (with child ID as the dependent variable and the desired variables as the IV's) and assessed using an analysis of Mahalanobis distance and again with output from AMOS 4 when this programme was used. Because clinical measures were used in a normal sample, there was moderate deviation from normality (e.g., CDI scores were skewed as most respondents reported low scores). As Mardia's coefficient of multivariate kurtosis in AMOS was a moderate 2.79 (cr .65) for the most complex model used, it was decided that transformation would not be attempted because of the difficulty of data interpretation (Tabachnick & Fidell, 2001).

Univariate outliers were found among only 3 children who were also identified as multivariate outliers in SPSS and AMOS. One seven year old boy who appeared to get into the study by mistake tended to answer inconsistently (e.g., high on the RCMAS, and CDI-S, yet very high on both the Harter and Perceived Control questionnaires with parent report SDQ being unremarkable); an eight year old boy appeared to be answering questions at the extreme ends of the scales at random and a young girl, identified by her principal as possibly not being suitable, did not appear to understand the questions. These children were eliminated from the study leaving a final total of 293 parent-child pairs.

### **12.5.3 Summary of Model Assessment and Development Strategy**

As discussed in Chapter 11, three basic models were specified and evaluated. The final model was then compared to another theoretically plausible model.

To evaluate these models, two strategies were employed—a strategy to identify mediating variables as suggested by theory and an overall evaluation of the hypothesised model by contrasting it with a theoretically viable alternative. These models were: 1) a model replicating the constructs used by Chorpita, Brown and Barlow (1998) using a larger sample and more specific measures as well as a model where the child report measures of control in the family were replaced by parent report measures; 2) a model replicating the more comprehensive theory of anxiety and depressive disorder development put forward by Barlow (2000, 2002; see also Chorpita, 2001); and 3) a model introducing other theoretical perspectives and indicators reflecting a more detailed composition of adversity and protective factors.

The strategy for identifying a mediation variable was based on the guidelines of Baron and Kenny (1986). As explained in more detail in Section 11.2.5., three conditions must be met in order to demonstrate a mediation effect: first, the regression of the mediator on the model predictor must be significant; second, the regression of the model criterion on the mediator must be significant and third, the correlation between the model predictor and model criterion must be significantly diminished or eliminated when controlling for the mediator. In all models in this study, it was predicted that perceived control or perceived competence would meet these three conditions as a mediator between early adversity and anxiety and depressive symptoms.

The second strategy used was a contrasting of the hypothesised final model with a theoretically plausible alternative model. This alternative model will represent a different theoretical relationship among the latent variables than does the hypothesised model. This model is evaluated using the fit indices described in Chapter 11 to determine the quality of fit of this model compared to the fit of the hypothesised one. It was predicted that the hypothesised model would fit the data better than the alternative model as

evaluated by the set of fit indices, especially as quantified by the Akaike's Information Criterion (AIC; Akaike, 1987) where the better the fit the lower the numerical value.

Before evaluating the structural models, an initial measurement model was tested with the subscale totals of the measures as indicator variables. However, before that step, a univariate correlation matrix was constructed to view the bivariate relationships between all variables. Additionally, subscales of the predictor variables which showed both theoretical and statistical promise underwent factor analysis to support their theoretical groupings. As discussed more fully in Section 11.3.3., factor analysis (using Principal Axis Factoring from SPSS 11.0) was chosen over the more well-known data reduction tool of principal component analysis because it was considered to be the preferred method for confirming a theoretical solution (Tabachnick & Fidell, 2000). This factoring method operates in the same manner as Confirmatory Factor Analysis (used in the Measurement Model) as it sorts for commonality among components to produce a factor with error involved rather than including error in the factor as principal component analysis does. This factor solution was further tested using the abovementioned measurement model where all latent variables were able to freely intercorrelate to determine the relationship between the measured variables and their latent constructs. Once this model was satisfactorily specified, the structural models were then specified and tested for mediation effects and the final complex hypothesised model was compared with an alternative model with theoretical plausibility as suggested by Anderson and Gerbing (1988). The results of this process are reported in the next chapter.

## CHAPTER 13

### RESULTS

#### 13.1. Chapter Overview and Study Purpose

This chapter begins with a summary statement of the present study's purpose and a review of demographic information. Then the results from a univariate analysis, a factor analysis of the predictor variables and a confirmatory factor analysis of the predictor and criterion variables is presented. Once the factors are identified, the various models derived from theory are then constructed and evaluated for model fit using various fit indices described in Section 11.2.2. They also are evaluated for the existence of mediation variables (using the guidelines of Baron and Kenny, 1986, described in Section 11.2.1.). Finally, the most complex theoretically and empirically viable model is compared for quality of model fit with a theoretically plausible alternative model constructed to represent a different conceptual relationship among the factors.

The purpose of the present study was to test three biopsychosocial models of anxiety and mood disorder aetiology that reflected the theory proposed by Barlow and colleagues (2002). Each model specified was assessed for the adequacy of model structure and tested for mediational effects. With its factor analysis of predictors and comparison of models within a larger model structure, this analysis had some exploratory aspects. However, because the number of factors to be used was determined *a priori* (Bollen, 2000) and principal axis factoring rather than principal component analysis was used (Tabachnick & Fidell, 2000; also see Sections 12.5.3. & 11.3.3.), the study had a primarily confirmatory focus.

Specifically, it included the replication and extension of an empirical mediation model, a theoretical model and the development and assessment of a more complex mediation model. All models were within

the recommended 5:1 subject-to-parameter ratio for model testing (Ullman, 2001). The most complex model had a subject-to-parameter ratio at approximately 5 to 1 (i.e., 4.8:1). The study used 161 girls (mean age 9.3 years) and 132 boys (mean age 9.2 years) and their most involved parent (94% were mothers) from a semi-rural area of New Zealand (see Table 12.1). These children were primarily from two parent families (70%), were of mainly New Zealand-European descent (86%) and were from homes with incomes in the middle range (75% from \$15,000 to \$60,000).

**13.2. Steps for Determining the Indicator Variables to Be Used**

**13.2.1. Univariate Correlation of Variables**

The subscales of the variables were arranged in a correlation matrix which allowed for the observation of univariate relationships between variables and the detection of possible multicollinearity and singularity. Correlations are presented in Table 13.1. These variables were grouped into predictor and criterion variables. Criterion variables are presented at the beginning of the table. Included with these variables are their means and standard deviations and the name of the measure from which they are derived.

Table 13.1

<b>Correlation Matrix of Observed Variables (with Means, Standard Deviations and Measure Names)</b>					
	1	2	3	4	5
Criterion Variables					
1.Child worry (M 4.2, SD 3.2) (RCMAS)					
2.Child physiological anxiety (M 4.4, SD 2.5)(RCMAS)	.67****				
3.Child social anxiety (M 2.7, SD 2.1)(RCMAS)	.68****	.64****			
4.Depressive symptoms(M 3, SD 2.9)(CDI-S)	.50****	.47****	.57****		
5.Child emotional behaviour (M 2.3, SD 2.1)(SDQ)	.17***	.20****	.18***	.25****	
Predictor Variables					
6.Parent anxiety (M 11.8, SD 6.8)(AMAS)	.08	.06	.12*	.09	.34****
7.Parent attachment security ® (M 8.7, SD 38..7)(SRASP)	.06	.16**	.12*	.11	.24****
8.Parent anger ( M 10.2, SD 2.8)(EAS)	.03	.02	.02	.00	.18***
9.Parent fear (M 9.6, SD 2.9)(EAS)	0.17***	.13*	.14*	.13*	.32****
10.Child report psychological control(M 19, SD 3.6)(CRPBIC)	.31****	.31****	.31****	.31****	.19****
11.Family enmeshment (M 9.2, SD 2.0)(SRMFF)	.26****	.27****	.22****	.25****	.21****
12.Family conflict (M 7.8, SD 2.1)(SRMFF)	.16**	.23****	.24****	.27****	.13*
13.Child attachment security® (M 10.4, SD 2.7)(SRASP)	.20****	.28****	.29****	.32****	.13*
14.Child report rejection (M 16, SD 3.4)(CRPBIC)	.17***	.23****	.29****	.39****	.16**
15.Family democratic style ® (M 9.2, SD 2.1)(SRMFF)	.03	.11	.12*	.15**	.08
16.Family cohesion ® (M 7.9, SD 1.9)(SRMFF)	.12*	.17***	.19	.20****	.06
17.Family sociability® (M 10.1, SD 1.5)(SRMFF)	.15**	.16**	.18***	.26****	.14**
18.Perceived emotional control(M 13.4, SD 2.2)(PCS)	-.13*	-.14*	-.13*	-	.01
19.Perceived attachment control (M 12.2, SD 2.3)(PCS)	-.11**	.21****	-.18***	.31****	-.03
20.Perceived academic control (M 14.4, SD 1.9)(PCS)	.21****	-.17**	-.25****	.34****	-.2****
21.Perceived social control (M 12.1, SD 2.7)(PCS)	.25****	-.27****	-.30****	.37****	-.01
22.Perceived social competence (M 16.7, SD 4.3)(SPPC)	-.4****	.38****	-.5****	.52****	-.15**
23.Perceived academic competence (M17.35, SD 3.7)(SPPC)	.32****	.32****	-.44****	.29****	-.2****
24. Parent rep. ch. temp. emotionality (M12.8, SD4.2) (EASC)	.12*	.17***	.09	.15**	.51****
25. Parent report child temp. shyness (M12.5, SD 3.6)(EASC)	.11*	.16**	.14*	.19****	.37****
26.Parent perceived controlling family total (M 30.7, SD 3.8)(CRPBIP)	.08	.14*	.11	.15**	.17***
	6	7	8	9	10
7.Parent attachment security ® (SRASP)	.41****				
8.Parent anger (EAS)	.26****	.16**			
9.Parent fear (EAS)	.62****	.44****	.26****		
10.Child report psychological control(CRPBIC)	.12*	.10	.07	.19****	
11.Family enmeshment (SRMFF)	.14*	.18***	.07	.18***	.53****
12.Family conflict (SRMFF)	.12*	.15**	.017	.13*	.46****
13.Child attachment security® (SRASP)	.03	.15**	.05	.16**	.39****
14.Child report rejection (CRPBIC)	.12*	.00	.13*	.09	.24****
15.Family democratic style ® (SRMFF)	.03	.04	.03	-.04	.15**
16.Family cohesion ® (SRMFF)	.15**	.14*	.09	.13*	.20****
17.Family sociability® (SRMFF)	.11	.02	-.01	.02	.06
18.Perceived emotional control (PCS)	.02	.05	.05	.06	-.03
19.Perceived attachment control (PCS)	-.07	-.09	-.03	-.11	-.17***
20.Perceived academic control (PCS)	-.12*	-.08	-.03	-.09	-.18***
21.Perceived social control (PCS)	.05	-.01	.04	.13*	.01
22.Perceived social competence (SPPC)	-.06	-.01	-.01	-.04	-.25****
23.Perceived academic competence (SPPC)	.23****	-.16**	.01	-.2****	-.29****

24. Parent rep. ch. temp. emotionality (EASC)	.27****	.24****	.18***	.29****	.18***
25. Parent report child temp. shyness (EASC)	.19****	.24****	.01	.2****	.08
26. Parent perceived controlling family total (CRPBIP)	.36****	.25****	.38****	.29****	.28****

	11	12	13	14	15
12. Family conflict (SRMFF)	.40****				
13. Child attachment security® (SRASP)	.25****	.22****			
14. Child report rejection (CRPBIC)	.16**	.40****	0.29****		
15. Family democratic style ® (SRMFF)	-.03	.22****	0.12*	.45****	
16. Family cohesion ® (SRMFF)	.14**	.45****	0.19****	.54****	.54****
17. Family sociability® (SRMFF)	-.00	.20****	0.10	.42****	.44****
18. Perceived emotional control (PCS)	-.01	-.11	-0.11	-.24****	-.25****
19. Perceived attachment control (PCS)	-.14*	-.24****	-0.29****	-.28****	-.27****
20. Perceived academic control (PCS)	-.14**	-.12*	-.12*	-.28****	-.24****
21. Perceived social control (PCS)	.03	-.10	-.11	-.17***	-.20****
22. Perceived social competence (SPPC)	-.2****	-.15**	-.31****	-.23****	-.1
23. Perceived academic competence (SPPC)	-.14**	-.14*	-.14*	-.2****	-.22****
24. Parent rep. ch. temp. emotionality (EASC)	.17**	.14*	.08	.06	.00
25. Parent report child temp. shyness (EASC)	.09	.13*	.17**	.12*	.16**
26. Parent perceived controlling family total (CRPBIP)	.2****	.23****	.2****	.26****	.06

	16	17	18	19	20
17. Family sociability® (SRMFF)	.50****				
18. Perceived emotional control (PCS)	-.25****	-.27****			
19. Perceived attachment control (PCS)	-.33****	-.26****	.53****		
20. Perceived academic control (PCS)	-.25****	-.27****	.56****	.38****	
21. Perceived social control (PCS)	-.13*	-.24****	.59****	.51****	.44****
22. Perceived social competence (SPPC)	-.16**	-.17****	.34****	.34****	.3****
23. Perceived academic competence (SPPC)	-.19****	.18*	.14**	.26****	.44****
24. Parent rep. ch. temp. emotionality (EASC)	.03	-.01	.09	.02	-.06
25. Parent report child temp. shyness (EASC)	.17**	.12*	-.05	-.12*	-.08
26. Parent perceived controlling family total (CRPBIP)	.19****	.12*	-.08	-.2****	-.19****

	21	22	23	24	25
22. Perceived social competence (SPPC)	.5****				
23. Perceived academic competence (SPPC)	.24****	.41****			
24. Parent rep. ch. temp. emotionality (EASC)	.02	-.11	-.12*		
25. Parent report child temp. shyness (EASC)	-.15**	-.18***	-.15****	.32****	
26. Parent perceived controlling family total (CRPBIP)	-.07	-.1	-.15****	.26***	.11

Note. RCMAS=Revised Children's Manifest Anxiety Scale; CDI-S=Child Depression Inventory-short form; SDQ=Strength and Difficulties Questionnaire; SRMFF=Self report Measure of Family Functioning; CRPBI=Child Report Parent Behaviour Inventory; AMAS=Adult Manifest Anxiety Scale; PCS=Perceived Control Scale; SPPC=Self Perceived Profile for Children; EASC=EAS Survey for Children; EAS=EAS Survey for Adults; SRASP=Self report Attachment security Prototypes; ®=reverse scored.

\*= $p < .05$ ; \*\*= $p < .01$ ; \*\*\*= $p < .005$ ; \*\*\*\*= $p < .001$ .

### 13.2.2. Factor Analysis of Predictor Variables

While hypothesised models and previous research have suggested a number of risk and protective factors leading to anxious and depressive

symptoms, there does not appear to have been a detailed analysis of how these predictors relate to each other or cluster together. Therefore, the next step in developing and testing a plausible model of biological and interpersonal factors that could predict distress in children was to factor analyse the predictor variables that were measured. After items which loaded highly on more than one factor or had very low communalities (i.e., below .3 on both; Tabachnick & Fidell, 2001) were removed, a principal axis factoring with varimax rotation, produced five interpretable factors with eigenvalues greater than 1.0 and factor loadings greater than .3. This five factor solution accounted for 56.8% of the variance in predictors. The rotated factor matrix is presented in Table 13.3. For ease of interpretation, the variables are grouped by factor and ordered by the size of their loading on each factor.

The first factor accounted for 22.9% of the variance (eigenvalue = 4.58). This factor, labelled *Control-related Beliefs*, consisted of six subscales, four of which denoted a child's perceived sense of control over their social, emotional and academic lives and their attachment to others and two denoting a child's perception of competence in the social and academic areas. The second factor consisted of four subscales accounting for 13.2% of the variance (eigenvalue = 2.64). This factor was labelled *Lack of Family Support* as it consisted of subscales related to child reported parental rejection and lack of family cohesion, democracy of decision-making and sociability with others. Four subscales loaded onto the third factor which was labelled *Parent Vulnerabilities* as it contained subscales relating to the parent's report of their own temperamental fearfulness and anger as well as anxiety and relationship insecurity. This third factor accounted for 8.5% of the variance in the factor (eigenvalue = 1.71). The fourth factor labelled *Family Control* accounted for 8.1% of the variance (eigenvalue = 1.62). The four subscales which loaded on this factor were child-reported family enmeshment and conflict that seemed to be theoretically indicative of a controlling family environment as well as attachment-related insecurity and psychologically controlling parenting style.

Table 13.2

**Rotated Factor Matrix of Predictor Variables**

Measured Predictor Variable	Factor				
	Control-related Beliefs (chreport)	Lack of Family Support (chreport)	Parent Personal Vulnerability (par-report)	Controlling Family Environmen (chreport)	Child Temper. Vulnerability (par-report)
Perceived social control (PCS)	<b>.787</b>		.164		-.168
Perceived emotional control (PCS)	<b>.733</b>	-.223			-.122
Perceived academic control (PCS)	<b>.628</b>	-.194	-.130		
Perceived attachment control (PCS)	<b>.591</b>	-.261		-.155	
Social competence (SPPC)	<b>.553</b>			-.280	-.238
Academic competence (SPPC)	<b>.388</b>	-.112	-.201	-.214	-.124
Fam cohesion ® (SRMFF)	-.119	<b>.791</b>	.128	.177	
Fam democratic style ® (SRMFF)	-.168	<b>.656</b>			
Parental rejection (CRPBI)	-.179	<b>.622</b>		.251	
Fam sociability ® (SRMFF)	-.229	<b>.595</b>			
Parent-fear (EAS-P)			<b>.783</b>	.131	
Par.-anxiety (AMAS)			<b>.771</b>		
Par relation security ® (SRASP-P)			<b>.507</b>		.217
Par-anger (EAS-P)			<b>.325</b>		
Psychological control (CRPBI)			.105	<b>.798</b>	
Fam enmesh. (SRMFF)			.152	<b>.643</b>	
Fam conflict (SRMFF)		.368		<b>.518</b>	
Child relation security ® (SRASP-C)	-.176	.127		<b>.409</b>	.150
Child-shyness (EASC)	-.101	.132	.163		<b>.615</b>
Child emotionality (EASC)			.327	.167	<b>.364</b>

Note. Principal Axis Factoring with Varimax Rotation. Strongest loadings appear in bold to illustrate final factor composition, PSC=Perceived Control Scale, SPPC=Self-Perceived Profile for Children, SRMFF= Self-report measure of Family Functioning, CRPBI=Child-report Parental Behaviour, SRASP=Self-report Attachment Style Prototypes, EASP= EAS Survey for Adult, EASC= EAS Survey for Children, AMAS=Adult Manifest Anxiety Scale, ch=child, Fam=Family, par=parent, enmesh=enmeshment, Temp=temperament, Environmen=Environment, ®=reverse scored.

The parent-reported child temperament variables, emotionality and child shyness, labelled *Child Temperamental Vulnerabilities*, comprised the fifth and final factor which accounted for 5.5% of the variance (eigenvalue = 1.1) (see Appendix D, note 2 for explanation of subscales not included in this factor structure). All of these factors were then put together and subjected to structural equation modelling analysis.

### **13.3. Structural Equation Modelling Analyses**

This section of the results is in two parts. First the measurement model was specified and evaluated using all of the predictor variables derived from the factor analysis and initially, a single criterion variable factor (i.e., a composite of child distress measures). Second, a number of structural models were specified and assessed for fit and mediation. For the purposes of determining specific effects, the cognitive factor was divided into two factors: Perceived Control and Perceived Competence. The criterion factor was divided into Anxiety Symptoms and a separate depressive symptoms indicator. To add method variance to the criterion variables, an indicator representing parent-reported child emotional behaviours was also added. An explanation of why certain measured variables were not included in the analysis can be seen in Appendix D, note 2.

#### **13.3.1. Measurement Model**

Using the first of the two-step process of model development (described most fully in Chapter 11), a confirmatory factor analysis was performed on the five predictor factors and one criterion factor. This measurement model is presented in Tables 13.3. and 13.4. Maximum likelihood method was employed for estimation because of its ability to work with moderate samples and moderate departures from normality (Hu & Bentler, 1999). In this model, as per SEM convention, circles represent unobserved or latent variables (factor and error terms) and rectangles represent observed variables (scale and subscale scores). Two headed arrows are correlations, while single-headed arrows (in the structural models

presented later) represent causal effects. Also according to SEM convention, the names of the factors or latent variables are capitalised while the factor indicators or single variables are not. In the measurement model, all latent variables are allowed to freely intercorrelate and the model is identified by setting one unstandardised factor loading for each factor (i.e., generally the variable with the highest loading on the factor labelled the marker variable) and all error terms to 1.0. Following the initial test of the measurement model, four correlations between error terms were added as they improved fit and were theoretically justifiable (i.e., family cohesion and conflict indicators were from the same measure and conceptually related; Stark, Humphrey, Crook & Lewis, 1990; attachment security and perceived attachment control were theoretically related, and the perceived academic and social control and competence indicators were theoretically and empirically linked; Weisz, Southam-Gerow & McCarty, 2001). Factor loadings were all satisfactory and comparable among indicators of each latent construct. Standardised residuals, which are estimates of the number of standard deviations the observed residuals are away from the zero residuals that would exist in a perfectly fitting model (Hayduk, 1987), were mostly within the -2.58 to +2.58 range acceptable for  $p < .05$  significance and appeared to form no particular pattern suggesting that model misspecification was not likely a problem. The fit indices were reasonable with GFI .90, CFI .91, RMSEA .058 (*pclose* .049) and AIC 597.3. All indicators were significantly related to their factor to  $p < .001$ . Perceived Control was not significantly correlated with Parent Vulnerabilities or Child Temperamental Vulnerabilities and Lack of Family Support was not correlated with Child Temperamental Vulnerabilities but the remaining factors were significantly correlated.

Table 13.3.  
**Measurement (Confirmatory) Model Analysis: Standardised and Unstandardised Path Coefficients with Critical Ratio Values**

Latent Factor and Indicator And Indicator Intercorrelations	Standardised Path Coefficient (Unstandardised)	Critical Ratio
1. Child Temperamental Vulnerabilities (parent-report)	.66 (1.00)	
emotionality	.48 (.63)	3.9
shyness		
2. Parent Vulnerabilities (parent-report)	.81 (1.00)	10.26
parent fearfulness	.55 (.86)	8.16
parental attachment security @	.33 (.39)	5.0
parental anger	.76 (2.18)	
parental anxiety		
3. Lack of Family Support (child-report)	.76 (1.00)	
lack of family cohesion	.64 (.68)	9.3
lack of family sociability	.67 (.96)	9.9
lack of democratic decision-making	.68 (1.62)	9.7
parental rejection		
4. Family Control (child-report)	.81 (1.00)	7.0
psychologically controlling parenting	.63 (.44)	9.3
family enmeshment	.57 (.40)	8.2
family conflict	.44 (.40)	
child attachment security @		
5. Perceived Competence (child-report)	.73 (1.00)	
perceived social competence	.55 (.67)	7.5
perceived academic competence		
6. Perceived Control (child-report)	.82 (1.00)	
perceived control over emotions	.66 (.81)	10.4
perceived control over attachment	.65 (.71)	11.2
perceived academic control	.72 (1.05)	11.3
perceived social control		
7. Negative Affect (child report)	.81 (1.00)	
worry	.78 (.74)	14.5
physiological anxiety	.84 (.68)	15.0
social anxiety	.67 (.75)	11.1
depression		
Indicator intercorrelations	.33 (0.68)	4.2
famcohr↔ famconf	.35 (1.86)	4.0
hartsoc ↔ pcsoc	.36 (1.61)	5.0
hartaca ↔ pcaca	-.21 (-.89)	-3.2
chattr↔ pcatt-		

Note. crpbire = parent rejection, cdito = depressive symptoms (CDI-S total), famcohr = family cohesion, famconf = family conflict, hartsoc = social competence, hartaca = academic competence, pcaca = perceived academic control, pcsoc = perceived social control, @ = reverse scored. Critical ratio guide: 1.96 =  $p < .05$ ; 2.58 =  $p < .01$ .

Table 13.4.  
**Measurement (Confirmatory) Model Analysis: Latent Factor Intercorrelations**

Variable	1	2	3	4	5	6	7
1. Child Temperament Vuln. (par)							
2. Parent Vulnerabilities (par)	.56**						
3. Lack of Family Support (ch)	.15	.16*					
4. Family Control (ch)	.34**	.27**	.36**				
5. Perceived Competence (ch)	-.30**	-.20*	-.41**	-.51**			
6. Perceived Control (ch)	-.03	-.01	-.50**	-.17*	.59**		
7. Anxiety & Depressive Symptoms (ch)	.28**	.20**	.32**	.51**	-.74**	-.35**	

Note. Par=parent report; ch=child report; Vuln=Vulnerabilities; \*= $p < .05$ . \*\*= $p < .01$ .

### **13.3.2. Analyses of Structural Models**

Three structural models are analysed: the first attempting to replicate the empirical model of Chorpita, Brown and Barlow (1998); the second adding a child temperament factor to represent Barlow's (2002) theory and the third a set of models incorporating other theories into Barlow's conceptualisation.

#### **13.3.2.1. Model 1: Replicated Mediation Model**

The first structural model to be specified and evaluated for fit and mediation effects was the model replication of Chorpita, Brown and Barlow (1998) and is presented in Figure 13.1. As discussed, their main hypothesis was that the influence of family environment on negative affect would be mediated by locus of control. In their words, "a family environment that affords the child diminished experience with personal control should foster a sense of low control, which in turn influences negative affect, and ultimately, clinical symptoms" (p. 267). Following Chorpita et al. (1998) recommendations, measures were made more representative of Barlow's (2002) elaboration of the theory. The FES control subscale was replaced with a measure of psychological control and rejection (Child Report Parent Behaviour, CRPBI; Schluderman & Schluderman, 1970) (see Section 11.3.1. for rationale). This predictor factor was labelled Parental Control to differentiate it from the Family Control factor used in later models. The cognitive mediator locus of control measure used by Chorpita et al. (1998) they concluded was too general. It was here, replaced by a direct, domain specific measure (Perceived Control, Weisz, 1986a; Thurber & Sigman, 1998) which Chorpita and Barlow (1998) suggested was closer to what they meant by Perceived Control. The Perceived Control Measure included the academic and social domains appropriate to a school sample as well as the added domains of attachment (being able to get help from others) and emotion (being able to change one's emotions) used originally by Thurber et al., (1998). The Chorpita et al. (1998) criterion measures were very similar to the ones used in the present study (RCMAS, CDI-S) with the exception

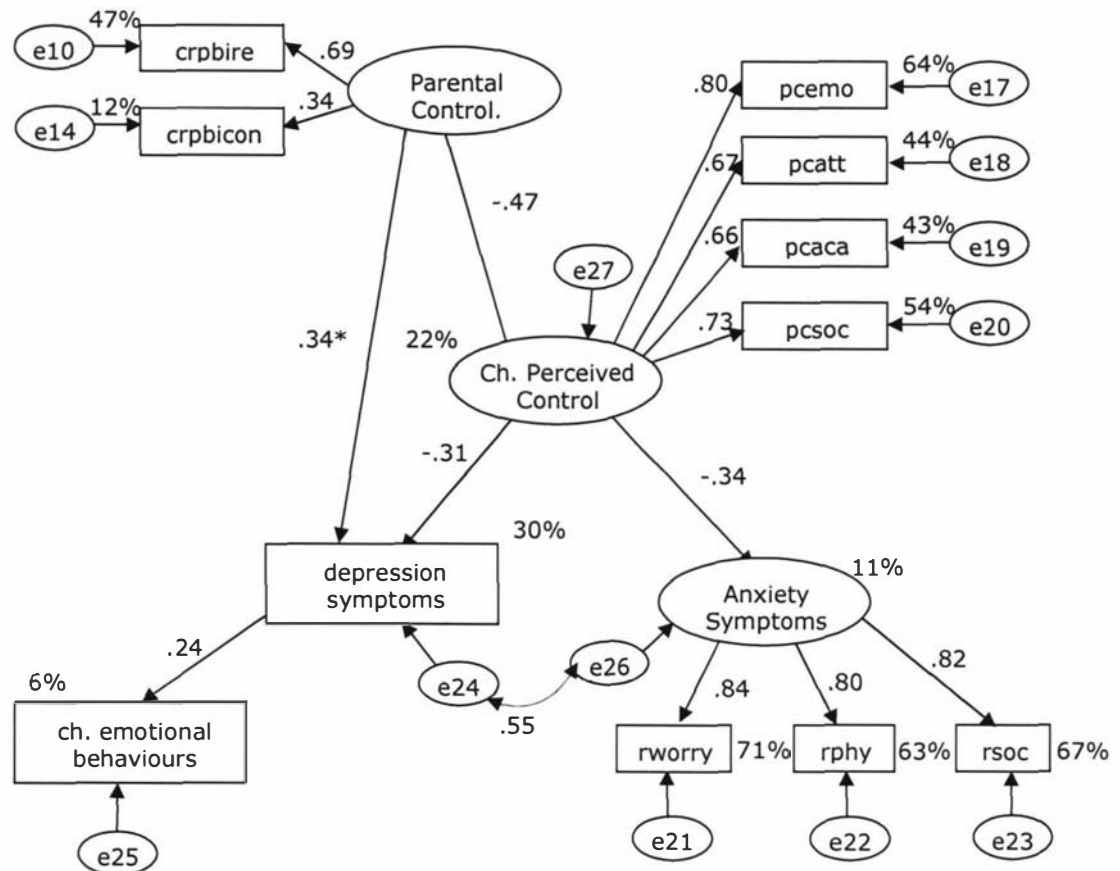


Figure 13.1. Path Diagram of the Replicated Mediation Model using more precise measures. crpbire = parent rejection. crpbicon = parental psychological control. pcemo = perceived emotional control. pcatt = perceived attachment control. pcaca = perceived academic control. pcsoc = perceived social control. rworry = RCMAS worry. rphy = RCMAS physiological anxiety. rsoc = RCMAS social concerns. cdi = depressive symptoms (CDI-S total). % = percent of indicator or factor variance explained. All parameter values are standardised.  $p < .001$  except one at \*  $p < .05$ .

of the CBCL Internalising subscale measure. In the current study this subscale was replaced by a shorter measure of emotional behaviours (Strengths and Difficulties Questionnaire; SDQ, Goodman & Scott, 1997) that demonstrates similar psychometric properties to the CBCL (Goodman & Scott, 1999). The model was specified and evaluated using these more specific measures.

The fit statistics for the replicated model indicated reasonable fit with GFI .92, CFI .89, RMSEA .099 *p*close .00, AIC 208.4. Evaluating this model using Perceived Control as the cognitive factor, a direct path was indicated between Family Control and Depression. When this path was added, the fit statistics for the replicated model improved with GFI .92,

CFI .91, RMSEA .09 *pclose* .00, AIC 193.4. Of concern was the RMSEA which was outside the range for adequate fit (i.e.,  $RMSEA > .08$ ; Hu & Bentler, 1999) but because this was not the final model, it was noted but the model was not rejected (see Figure 13.1.).

With the present data, a better fitting model was found when depressive symptoms and parent perceived child emotional behaviours were separated from the Anxiety Symptoms factor, a difference from the Chorpita, Brown and Barlow (1998) model. Although parent perceived child emotional behaviours were not associated with child perceptions of Perceived Control or Anxiety, there was a significant path between child-perceived depressive symptoms and parent perceived child emotional behaviours. Statistically significant standardised path coefficients were observed between Parental Control and Perceived Control ( $-.47$   $p < .002$ ) and between Perceived Control and Anxiety Symptoms ( $-.34$   $p < .001$ ) and Perceived Control and depression symptoms ( $-.31$   $p < .001$ ).

These parameters indicated that 22% of the variance in Perceived Control was accounted for by Parental Control; 12% of the variance in Anxiety Symptoms was accounted for by Perceived Control and 10% of the variance in depressive symptoms was accounted for by Perceived Control. A direct path between Parental Control and depressive symptoms ( $.34$   $p < .03$ ) explained a further 12% of the variance in depressive symptoms. Once specified and evaluated for fit, it was necessary to investigate this replication for mediation effects.

Mediation effects were assessed following Baron and Kenny's (1986) procedure described in Chapters 11 and 12. For clearer observation of significance levels, it was decided that the critical ratio (cr) of the parameters would be used (cr is the parameter estimate divided by the standard error). A cr value outside of -1.96 and +1.96 indicates a significance value less than .05 which for this study was considered statistically significant (Hair et al., 1998).

To test the hypothesised mediating effect of perceived control, a series of regression equations were analysed using SEM. Satisfying the first and second conditions, the standard path coefficients between Parental Control and Perceived Control and between Perceived Control and Anxiety and depression symptoms were all statistically significant (see Figure 13.1.). To satisfy the third condition, consistent with traditional regression approaches of assessing the effects of the predictor on the criterion variable while controlling for the potential mediator in the model, the two predictors (Parental Control and Perceived Control) were allowed to correlate. Unlike what was found in the Chorpita et al (1998) study, the paths between Parental Control and Anxiety (.65 *cr* 3) and Parental Control and depression (.66 *cr* 3.4) were significant, so the first part of the third condition was only partially met. However, removing the paths between Perceived Control and Anxiety and Perceived Control and depression, the path from Parental Control to Anxiety increased to .66 and became more significant (*cr* 4.2) as did the path between Parental Control and depression (.79, *cr* 4.9). The results of this last test met the third criterion (Baron & Kenny 1986), indicating that Perceived Control partially mediated the relationship between Parental Control and both Anxiety and depressive symptoms. The use of more specific measures and a school sample of children changed the full mediation effect of Perceived Control found by Chorpita et al. (1998) to a partial one.

Additional analyses were conducted first to see whether the differing results were because of the more specific nature of the criterion variables in the present study and second, to see if shared method variance accounted for the result. When combining Anxiety and depressive symptoms and child emotional behaviour into one latent variable (as done by the previous study), a partial mediation effect was also found (see Appendix D, Note 1a).

To determine whether the mediation relationship was not purely a result of shared child method variance, this model was respecified using a parent indicator for Parental Control (see Figure 1a and note 1 in

Appendix D). Results of this analysis revealed a full mediation effect of Perceived Control on both Anxiety and depressive symptoms.

### **13.3.2.2. Model 2: Two Parts of Barlow's Theoretical Model**

After establishing a partial mediation model using similar measures to the study by Chorpita et al (1998) and a full mediation model using a parent-report measure, the next step was to specify and evaluate a model which would be similar to the theory advanced by Barlow (2002; Chorpita & Barlow, 1998; Chorpita, 2001). This entailed adding a measure of child temperamental vulnerability to the first model. Emotionality and shyness were chosen as indicators of the child temperament vulnerability that most resembled Barlow's (2002) theoretical construct of biological vulnerability. For verification that these variables were heritable, Barlow cited the works of Kagan (1997) in the area of Behaviour Inhibition and Lewis (1993) and earlier researchers in the area of 'stranger distress' and Buss and Plomin (1984) who saw emotionality and shyness as innately driven temperamental vulnerabilities. Barlow (2002) and Plomin and Stocker (1989, cited in Barlow, 2002) have suggested that emotionality and shyness were the traits underlying Behavioural Inhibition.

This model was specified and evaluated (see Figure 13.2.). Model fit was better than the previous replication model using child report measures (Figure 13.1.) with GFI .94, CFI .95, RMSEA .06 *pclose* .14, AIC 184.9 (for comparison see Table 13.5.). All paths were statistically significant to  $p < .001$  except the path between Perceived Control and depressive symptoms which was, nevertheless, significant at  $p < .05$ . While there was a statistically significant path from Parental Control to Perceived Control and from Perceived Control to depressive symptoms, there was not a significant path from Perceived Control to Anxiety Symptoms. Child Temperamental Vulnerabilities accounted for 15% of the variance in Parental Control (path coefficient .38) and Parental Control accounted for 18% of the variance in Perceived Control (path coefficient -.42).

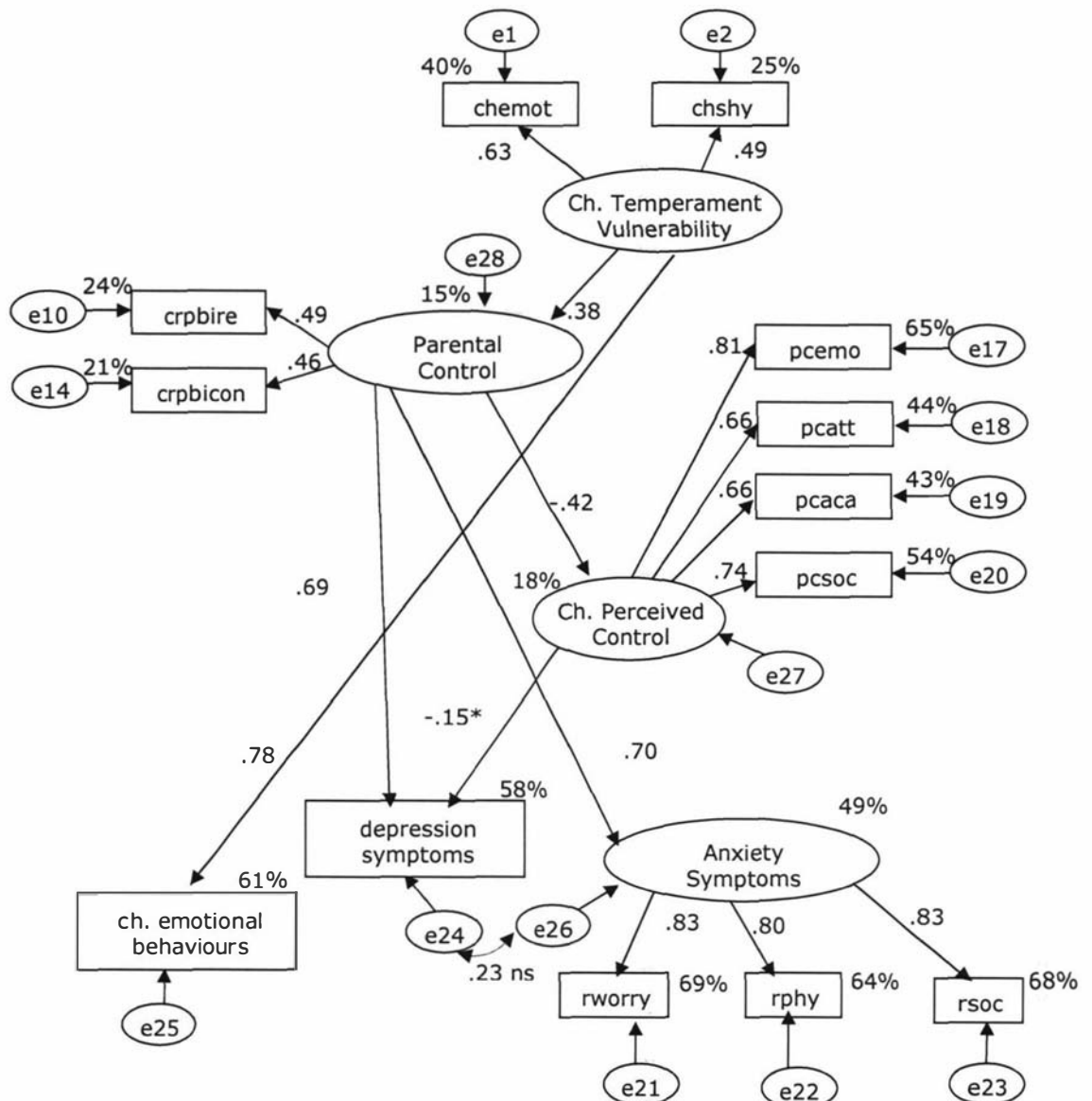


Figure.13.2. Path Diagram of the Replicated Model Adding Child Temperamental Emotionality & Shyness (Barlow's Model).chemot = child emotionality. chshy = child shyness. crpbire = parent rejection. crpbicon = parental psychological control. pchemo = perceived emotional control. pcatt = perceived attachment control. pcaca = perceived academic control. pcsoc = perceived social control. rworry = RCMAS worry. rphy = RCMAS physiological anxiety. rsoc = RCMAS social concerns. cdito = depressive symptoms (CDI-S total). % = percent of indicator or factor variance explained. All parameter values are standardised. ns = non significant.  $p < .001$  except one where\*  $p < .05$ .

Possibly because of the influence of shared method, there was a direct, statistically significant path from Child Temperamental Vulnerability to child emotional behaviours (.78). This Temperamental Vulnerability accounted for 61% of the variance in child emotional behaviours. Parental Control also directly influenced Anxiety Symptoms (.70) accounting for 49% of the variance in these symptoms as well as directly

accounting for 48% of the variance in depressive symptoms (.69). Perceived Control only accounted for a little more than 2% of the variance in depressive symptoms and, as mentioned, was not significantly related to Anxiety Symptoms (A) or child emotional behaviours (CEB).

Although Parental Control did not mediate the relationship between Child Temperamental Vulnerabilities (Chtemp) and Perceived Control (PC), PC partially mediated the relationship between Parental Control (CF) and depressive symptoms (D) (path coefficients .69, *cr* 5.0 when Chtemp/PC correlated and .78, *cr* 5.7 when PC constrained). Also, as predicted by Barlow's theory, Parental Control fully mediated the relationship between Child Temperamental Vulnerabilities and both Anxious (path coefficients .04, *ns* when Chtemp/CF correlated and .32, *cr* 3.8 when CF constrained) and depressed feelings (path coefficients .07, *ns* when Chtemp/CF correlated and .14, *cr* 1.4 when CF constrained). The addition of Chtemp did not change the relationship between PC and D but it did create insignificant paths between PC and A and between PC and CEB. The presence of Chtemp also substantially increased the variance in the criterion variables compared with the model without the construct (Figure 13.1). The amount of total variance accounted for in A was 49% and in D was 58% (see Figures 13.1 & 13.2.).

Summarising Model 2, when Parental Control and Child Temperamental Vulnerabilities were used as predictor variables in keeping with Barlow's (2002) theory, Perceived Control appeared to play a minimal role (accounting for variance in Depressive Symptoms alone and only explaining 2% of that variance). There also appeared to be more direct paths between family adversity and criterion variables in the model that had the best fit. That is, parental control directly influenced both depression and Anxious Symptoms and accounted for substantial variance (47% and 49% respectfully). Parental Control also fully mediated the relationship between Child Temperament and both Anxious and depressed feelings. In this model, Child Temperament directly influenced child emotional behaviours. Perceived Control partially mediated the

relationship between Parental Control and depressive symptoms and accounted for considerably less variance in depression symptoms than did Parental Control directly. However, Perceived Control did not relate to either Anxiety Symptoms or child emotional behaviours. The addition of Child Temperamental Vulnerabilities substantially increased the total variance of the criterion variables accounted for by the other variables in this model. The next question to be considered was whether adding a parent vulnerability factor and more defined family vulnerability would change how Perceived Control acted in relationship to the predictor and criterion variables. This is explored in a more complex structural model.

#### **13.3.2.3. Model 3: Complex Biopsychosocial Risk Model Analyses**

The complex structural model included parent-reported Parent Vulnerabilities and Child Temperamental Vulnerabilities, two child-reported Family Environment Factors, Perceived Control and Perceived Competence. To recap the hypothesis, according to Barlow's model and other research reviewed in the introduction, it was proposed that control-related beliefs (i.e., Perceived Control and Perceived Competence) would mediate the relationship between the other predictor and criterion variables. It was further proposed that Child Temperament, affected by Parent Vulnerabilities (Manassis & Bradley, 1994; Rubin & Burgess, 2001) would be an influence on the child's perceptions of Family Control and Lack of Support. Further, this combined predictor relationship would affect the manifestation of Anxiety and depressive symptoms and parent-perceived child emotional behaviours through the cognitive mediators of the child's perceptions of their Control and Competence.

Based on theoretical and empirical grounds (see Section 13.2.2. and Sections 11.3.4, 11.3.5.), Family Environment was divided into Lack of Family Support and Family Control (to differentiate it from Parental Control in the two previous models) with the addition of subscales from a general family functioning measure (SRMFF) and a measure of child relationship insecurity. The Family Control construct was represented by

subscale indicators that measured child perceptions of parental psychological control, family enmeshment, family conflict and attachment-related insecurity, while the Lack of Family Support construct was represented by variables that measured child perceptions of lack of family cohesion, parental rejection, lack of family democratic decision-making and lack of family sociability. The marker variables that most define the latent variables were psychological control for the Family Control factor and lack of family cohesion for the Lack of Family Support factor. The Parental Vulnerabilities factor introduced into this model included parent self-report measures of anxiety, fearful and angry temperament and attachment-related insecurity, with the marker variable being fearfulness closely followed by anxiety. The marker variable for Perceived Control was emotional control most closely followed by social control while the marker for Perceived Competence was social competence. This model also included the criterion measures of child-reported Anxiety Symptoms, depressive symptoms and parent-reported child emotional behaviours used in the previous models.

Before assessing the overall model, models were assessed to give a fuller understanding of how individual components inter-related (Carver, 1989). The first assessment was how the individual cognitive factors related to the other factors. For this, two models were specified; one with Perceived Control as the cognitive factor and the other with Perceived Competence as the cognitive factor. As with the previous models, both were assessed for fit as well as mediation effects according to the theory.

#### **13.3.2.4. Complex Model with Perceived Control as Cognitive Factor and Both Family Factors**

The model was specified and evaluated and is presented in Figure 13.3. As with the measurement model, two error terms were allowed to intercorrelate (between child perceived attachment security and attachment control as well as family cohesion and family conflict which appeared in the measurement model).

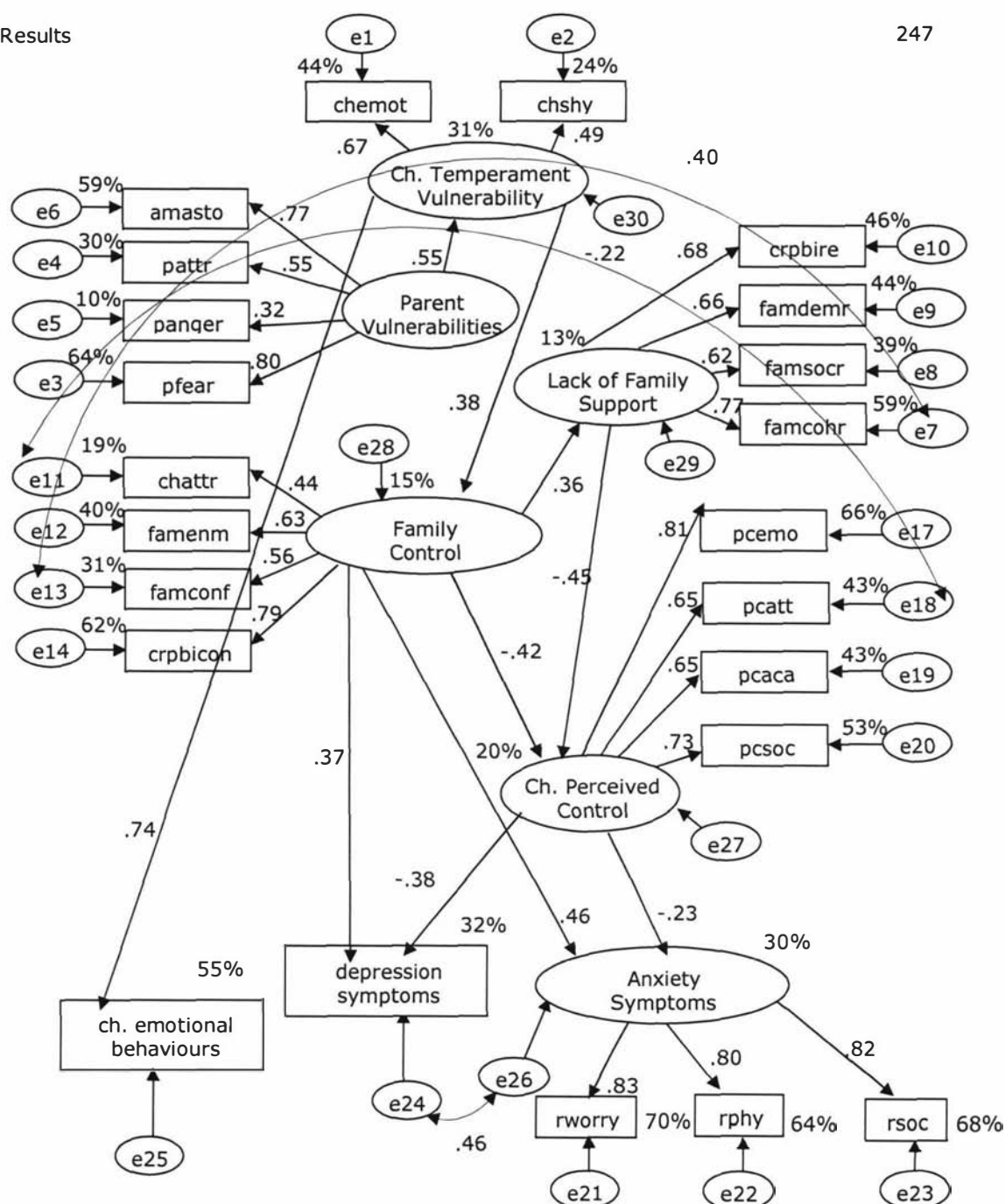


Figure 13.3. Path Diagram of the Complex Model of Distress Development Adding a Parent Vulnerabilities Factor, Two Family Factors and Perceived Control as Cognitive Mediator. chemot = child emotionality. chshy = child shyness. pfear = parent fearfulness. pattr = parent relationship security (reverse scored). panqer = parent anger. amasto = total adult manifest anxiety schedule. famcohr = family cohesion (reverse scored). famsocr = family sociability (reverse scored). famdemr = family democratic style (reverse scored). crpbire = parent rejection. pcemo = perceived emotional control. pcatt = perceived attachment control. pcaca = perceived academic control. pcsoc = perceived social control. chatter = child relationship security (reverse scored). famenm = family enmeshment. famconf = family conflict. crpbicon = parental psychological control. rworry = RCMAS worry. rphy = RCMAS physiological anxiety. rsoc = RCMAS social concerns. cdito = depressive symptoms (CDI-S total). % = percent of indicator or factor variance explained. All parameter values are standardised. All parameters  $p < .001$ .

Both made theoretical and empirical sense with the attachment indicators addressing the same concept and the family indicators, from the same measure, also measuring similar concepts. All were child-reported measures so also shared method variance. Again, the anxiety factor and depression indicator were correlated to reflect the relationship between those measures. This is in keeping with Hair et al.'s (1998) point that unless the correlation of indicators is theoretically and empirically viable, correlating error terms among endogenous variables contaminates the meaning of the latent variables and makes interpretation of results difficult.

Fit indices suggested an adequate fit for the model with GFI .91, CFI .93 and RMSEA .05 *pclose* .57, AIC 486.4. Statistically significant path coefficients were observed for all relationships between the latent variables. All paths were significant to  $p < .001$ . As most fit indices penalise sample size and reward parsimony, the RMSEA (comparing observed and predicted covariance matrices) was a more accurate index for this model and fell well within the acceptable limits of good fit (i.e., below .06 and *pclose* above .05).

Looking at the model paths, Parental Vulnerabilities explained 30% of the variance in Child Temperamental Vulnerabilities (path coefficient .55) and Child Temperamental Vulnerabilities explained 14% of the variance in Family Control (path coefficient .38). Family Control explained 13% (.36) of the variance in Lack of Family Support and Lack of Family Support explained 20% (-.45) of the variance in Perceived Control which then explained 5% (-.23) of the variance in Anxiety Symptoms and 14% (-.37) of the variance in depressive symptoms. Additionally, Family Control directly explained 21% of the variance in Anxiety Symptoms (.46) and 14% of the variance in depressive symptoms (.37). Parent-reported Child Vulnerabilities influenced indirectly by the effect of Parent Vulnerabilities on Child Temperament, explained 55% of the variance in parent-reported child emotional behaviour (.74). It was noted that child emotional behaviour reported by parents was not influenced by Family

Control or Perceived Control in this model as was the case with the previous model (i.e., Figure 13.2). Overall variance in Anxiety and depression explained by this model was 30% and 33%, respectively.

Testing for mediation, two mediation chains were identified. Child Temperamental Vulnerabilities (Chtemp) fully mediated the relationship between Parent Vulnerabilities (Pvul) and Family Control (path coefficients .12, ns when Pvul/Chtemp correlated and .31, cr 4.1 when Chtemp constrained). In turn, Family Control partially mediated the relationship between Child Temperamental Vulnerabilities and both Anxiety (path coefficients .15, cr 2.1 when Chtemp/FC correlated and .30, cr 4.1 when FC constrained) and depressive symptoms (path coefficients .17, cr 2.7 when Chtemp/FC correlated and .29, cr 4.4 when FC constrained). In the second chain, as reported above, Child Temperamental Vulnerabilities fully mediated the relationship between Parental Vulnerabilities and Family Control. Then, Family Control fully mediated the relationship between Child Temperamental Vulnerabilities and Lack of Family Support (path coefficients .06, ns when Chtemp/FC correlated and 2.2, cr 2.5 when FC constrained). In turn, Lack of Family Support fully mediated the relationship between Family Control and Perceived Control (path coefficients -.02, ns when FC/LFS correlated and -.2, cr -2.6 when LFS constrained) and finally, Perceived Control (PC) fully mediated the relationship between Lack of Family Support (LFS) and both Anxious (path coefficients .04, ns when LFS/PC correlated and .16, cr 2.3 when PC constrained) and depressive symptoms (path coefficients .02, ns when LFS/PC correlated and .24, cr 3.5 when PC constrained). This fulfilled the three conditions for full mediation (Baron & Kenny, 1986). This chain of influence from Parent Vulnerabilities to Anxious and depressive symptoms through the mediators of Child Vulnerabilities, Family Control, Lack of Family Support and Perceived Control supports the theory proposed by Barlow as well as its extension.

Because less of the overall variance in the criterion variables was accounted for than in the previous simpler model, another analysis was

conducted to see if another theoretically relevant cognitive construct, perceived competence, would account for more of the total variance. Also of interest was whether perceived competence (i.e., a child perceiving themselves as socially and academically competent compared with their peers) would mediate the relationship between the adverse family environmental and biological vulnerability factors and anxiety and depressive symptoms. Although perceived competence was not described explicitly in Barlow's model, it is integral to Weisz's (1990) model of perceived control.

#### **13.3.2.5. Complex Model with Perceived Competence as the Cognitive Factor and Both Family Factors**

When substituting Perceived Competence (Pcomp) for Perceived Control (PC) in the Complex Model (Figure 13.3) with both family environment factors (see Figure 13.4.), fit indices were as follows: GFI .92, CFI .94, RMSEA .044, *pclose* .83, AIC 385.5. As with Figure 13.3, error terms between subscales of the family function measure (family conflict and family cohesion) were correlated. Fit indices for this model were superior to the model with Perceived Control as the cognitive mediator (compare Figure 13.3 & 13.4 in Table 13.5) with the AIC also indicating superior fit. In contrast to the PC model (Figure 13.3), there were no direct relationships between Family Control (FC) and Anxiety and depression and the path between FC and Pcomp became significant. Comparing this model with the PC model where possible, Parental Vulnerabilities accounted for similar variance in Child Temperamental Vulnerabilities (32% vs. 31%) and Child Temperamental Vulnerabilities accounted for similar variance in Family Control (16% vs. 15%). Family Control accounted for similar variance in Lack of Family Support (14% vs. 13%) while Lack of Family Support accounted for less variance in Perceived Competence versus Perceive Control (5% vs. 20%). Perceived Competence accounted for substantially more variance in Anxiety (63% vs. 5%) and depressive symptoms (51% vs. 14%). Family Control also accounted for 26% of the variance in Perceived Competence here.

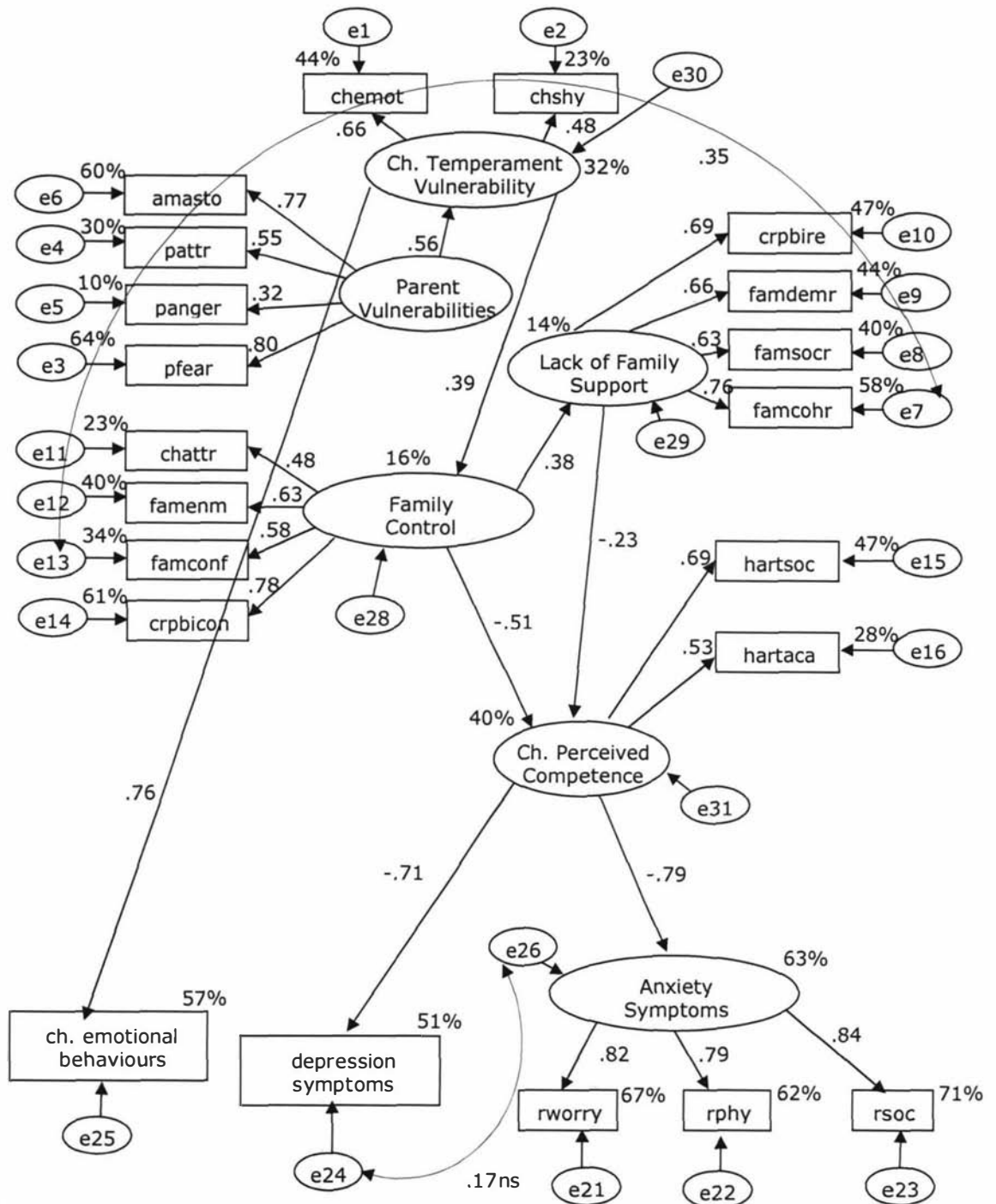


Figure 13.4. Path Diagram of the Complex Model of Distress Development With Perceived Competence as Mediator. *chemot* = child emotionality. *chshy* = child shyness. *pfear* = parent fearfulness. *pattr* = parent relationship security (reverse scored). *panger* = parent anger. *amasto* = total adult manifest anxiety schedule. *famcohr* = family cohesion (reverse scored) *famsocr* = family sociability (reverse scored). *famdemr* = family democratic style (reverse scored). *crpbire* = parent rejection. *hartsoc* = perceived social competence. *hartaca* = perceived academic competence. *chattr* = child relationship security (reverse scored). *famenm* = family enmeshment. *famconf* = family conflict. *crpbicon* = parental psychological control. *rworry* = RCMAS worry. *rphy* = RCMAS physiological anxiety. *rsoc* = RCMAS social concerns. *cdito* = depressive symptoms (CDI-S total). % = percent of indicator or factor variance explained. All parameter values are standardised. All parameters  $p < .001$ .

Neither Perceived Competence nor Perceived Control related directly to parent-reported child emotional behaviours in either model. Two mediational chains similar to that found with Perceived Control were observed between biological vulnerabilities and criterion variables. In both chains, Child Temperamental Vulnerabilities fully mediated the relationship between Parent Vulnerabilities and Family Control (path coefficients .11, ns when Pvul/Chtemp correlated and .31, cr 4.1 when Chtemp constrained) with similar values as in the equivalent Perceived Control model. With the longer chain, Family Control fully mediated the relationship between Child Temperament and Lack of Family Support (path coefficients .08, ns when Chtemp/FC correlated and .23, cr 2.9 when FC constrained), Lack of Family Support partially mediated the relationship between Family Control and Perceived Competence (path coefficients -.51, cr - 5.8 when FC/LFS correlated and -.62, cr -6.8 when LFS constrained) and Perceived Competence fully mediated the relationship between Lack of Family Support and Anxiety (path coefficients .05, ns when Pcomp/LFS correlated and .37, cr 4.8 when Pcomp constrained) and depressive symptoms (path coefficients .08, ns when Pcomp/LFS correlated and .42, cr 5.8 when Pcomp constrained). In this mediation, as with PC in Figure 13.3, it appeared that both areas of family adversity worked together but slightly differently depending on the cognitive mediator present in the model. In the shorter chain, unlike the model with Perceived Control as mediator (Figure 13.3), the cognitive mediator was involved in a mediation chain through Family Control. Here, Family Control partially mediated the relationship between Child Temperament and Perceived Competence (path coefficients -.19, cr -2.5 when FC/Pcomp correlated and -.33, cr -4.1 when FC constrained) and Perceived Competence partially mediated the relationship between Family Control and both Anxiety (path coefficient .22 cr 2.7 when Pcomp/FC correlated and .59, cr 6.6 when Pcomp constrained) and depressive symptoms (path coefficients .21, cr 2.8 when Pcomp/FC correlated and .55, cr 6.5 when Pcomp constrained).

In summarising the difference between the influence of Perceived Control and Competence as cognitive mediators (Figures 13.3., 13.4.), perceived competence appeared to have the greater protective influence against anxious and depressed symptoms in the face of biological and environmental adversity. Next investigated was how the different family factors related in the model when both cognitive mediators were present.

#### **13.3.2.6. Lack of Support as the Family Factor and both Perceived Control and Competence as Cognitive Factors**

This model did not fit as well as the previous two with GFI 91 CFI 94 RMSEA .05 *p*close .4 AIC 419.9 (see Figure 13.5, Table 13.5). Parent Vulnerabilities explained 31% (.56) of the variance of Child Temperament, Child Temperament explained 4% (.20) of the variance in Lack of Family Support and 10% (-.32) of the variance in Perceived Competence; Lack of Family Support accounted for 23% (-.48) variance in Perceived Control and Perceived Control explained 34% (.58) of the variance in Perceived Competence. Perceived Competence, then, explained 46% (-.68) of the variance in Anxiety Symptoms and 46% (-.67) of the variance in depressive symptoms. As with the other models, Child Temperament which was influenced by Parent Vulnerabilities, here solely explained 58% (.76) of the variance in parent-reported child emotional behaviours. Overall, variance in Anxiety and depressive symptoms accounted for was 46% and 46%.

In this model, Lack of Family Support did not mediate the relationship between Child Temperament and Perceived Control. However, Perceived Control fully mediated the relationship between Lack of Family Support (path coefficients -.13 ns when LS/PC correlated and -.44 cr -5.2 when PC constrained) and Perceived Competence. Also, Perceived Competence fully mediated the relationship between Perceived Control and Anxiety (path coefficients -.09 ns when PC/Pcomp correlated and -.34 cr -4.8 when Pcomp constrained) and depression (path coefficients -.14 ns when PC/Pcomp correlated and -.47 cr -7.1 when Pcomp constrained).

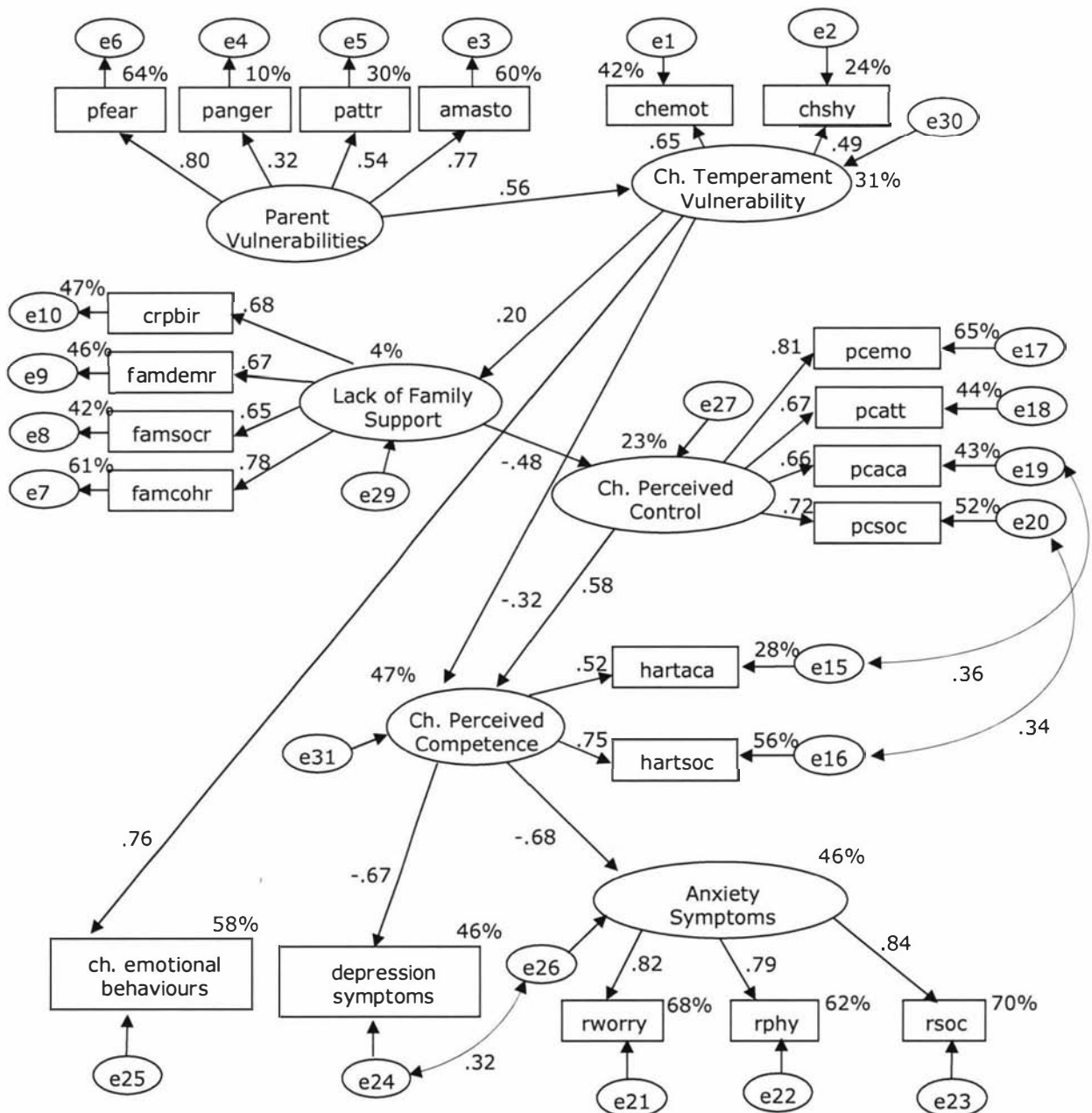


Figure 13.5. Path Diagram of the Complex Model of Distress Development with Lack of Support as Family Factor and Perceived Control and Perceived Competence as Cognitive Mediators. chemot = child emotionality, chshy = child shyness, pfear = parent fearfulness, pattr = parent relationship security (reverse scored), panger = parent anger, amasto = total adult manifest anxiety schedule, famcohr = family cohesion (reverse scored), famsocr = family sociability (reverse scored), famdemr = family democratic style (reverse scored), crpbir = parent rejection, hartsoc = perceived social competence, hartaca = perceived academic competence, pemo = perceived emotional control, pcatt = perceived attachment control, pcaca = perceived academic control, pcsoc = perceived social control, rworry = RCMAS worry, rphy = RCMAS physiological anxiety, rsoc = RCMAS social concerns, cdito = depressive symptoms (CDI-S total), % = percent of indicator or factor variance explained. All parameter values are standardised. All parameters  $p < .001$ .

In addition, Perceived Competence partially mediated the relationship between Child Temperament and Anxiety (path coefficients  $-.14$  cr  $-2.9$  when ChTemp/Pcomp correlated and  $-.36$  cr  $-4.3$  when Pcomp constrained) and depression (path coefficients  $-.15$  cr  $-2.3$  when ChTemp/Pcomp correlated and  $-.36$  cr  $-4.6$  when Pcomp constrained).

#### **13.3.2.7. Family Control as the Family Environment Factor with both Perceived Control and Perceived Competence as Cognitive Factors**

Fit indices in this model were better than the previous model (see Table 13.5): GFI .92, CFI .94, RMSEA .048, *pclose* .65, AIC 401.9 (see Figure 13.6). Child Temperament accounted for 31% (.56) of the variance in Family Control, Family Control accounted for 3% (-.16) of the variance in Perceived Control and 17% (-.41) of the variance in Perceived Competence. Perceived Control accounted for 29% (.54) of the variance in Perceived Competence which then accounted for 81% (-.90) of the variance in Anxiety Symptoms and 49% (-.70) in depressive symptoms. Perceived Control also accounted for 6% (-.25) of the variance in Anxiety Symptoms but there was not a significant path from Perceived Control to depressive symptoms. This model with Family Control as the family factor accounted for more variance overall in Anxiety (56% vs. 46%) and depression (48% vs. 46%) than did the previous model with Lack of Family Support as the family factor.

In this model, Family Control did not mediate the relationship between Child Temperament and Perceived Control. Also Perceived Control did not mediate the relationship between Family Control and Anxiety. However, partial mediation effects were observed with Perceived Control partially mediating the relationship between Family Control and Perceived Competence (path coefficients  $.41$  cr  $-5.5$  when FC/PC correlated and  $.6$  cr  $-5.6$  when PC constrained).

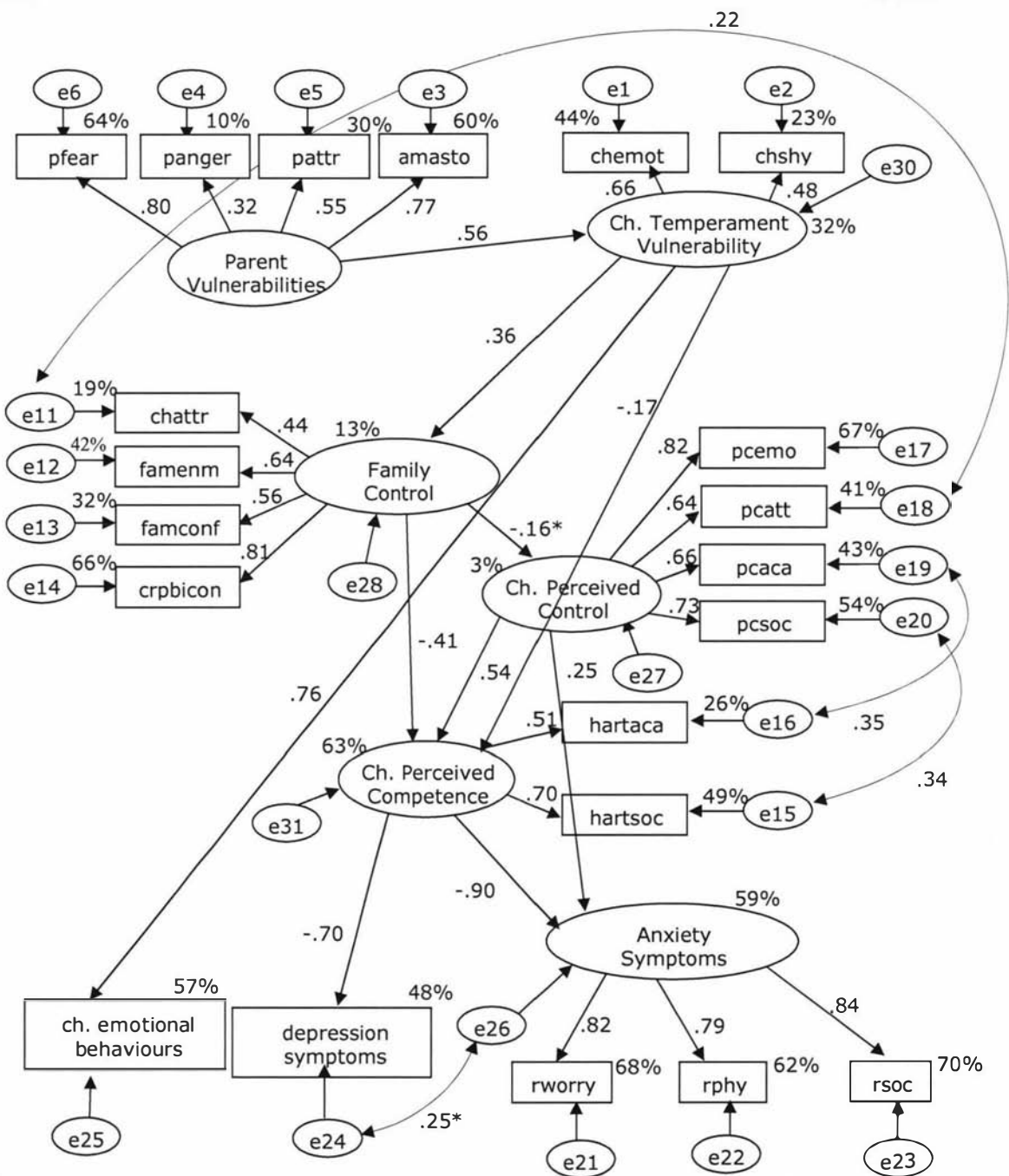


Figure 13.6. Path Diagram of the Complex Model of Distress Disorder Development with Family Control as Family Factor and Perceived Control and Perceived Competence as Cognitive Mediators. chemot = child emotionality. chshy = child shyness. pfear = parent fearfulness. pattr = parent relationship security (reverse scored). panger = parent anger. amasto = total adult manifest anxiety schedule. hartsoc = perceived social competence. hartaca = perceived academic competence. pchemo = perceived emotional control. pcatt = perceived attachment control. pcaca = perceived academic control. pcsoc = perceived social control. chatter = child relationship security (reverse scored). famenm = family enmeshment. famconf = family conflict. crpbicon = parental psychological control. rworry = RCMAS worry. rphy = RCMAS physiological anxiety. rsoc = RCMAS social concerns. cdito = depressive symptoms (CDI-S total). % = percent of indicator or factor variance explained. All parameter values are standardised. All parameter  $p < .001$  except one where  $*p < .05$ .

Additionally, Perceived Competence was able to fully mediate the relationship between Family Control and both depression (path coefficients .11 ns when FC/Pcomp correlated and .53 or 6.5 when Pcomp constrained) and Anxiety Symptoms (path coefficients .11 ns when FC/Pcomp correlated and .58 or 6.5 when Pcomp constrained). In this model, only 3% of Perceived Control compared with 63% of Perceived Competence was involved. Perhaps perceived competence is more necessary. This is discussed further in Chapter 14.

As these two family factors appeared to perform quite differently in the model (i.e., Family Control was observed to contribute to more variance in Anxiety and depression than Lack of Family Support), investigation turned to how individual family factors related to individual cognitive factors.

#### **13.3.2.8. Lack of Family Support as the Family Environment Factor with Perceived Control as the Cognitive Factor**

Because Lack of Family Support and not Family Control was correlated with the cognitive mediator, Perceived Control in the previous models, the question arose as to what role it played in the model with only Perceived Control as the cognitive factor. Fit indices were as follows: GFI .92, CFI .95, RMSEA .042 *p*close .6 and AIC 332.8. This model is presented in Figure 13.7. The two direct paths from Child Temperament Vulnerabilities accounted for 7% (.27) of the variance in Anxiety Symptoms and 7% (.27) in the variance of depressive symptoms. Also Child Temperamental Vulnerabilities accounted for 4% (.19) of the variance in Lack of Family Support. Parental Vulnerabilities explained 29% (.54) of the variance in the Child Temperamental Vulnerability Factor. Lack of Family Support accounted for 22% (-.47) of the variance in Perceived Control which, in turn, accounted for 10% (-.31) and 19% (-.44) of the variance in Anxiety and Depressive Symptoms respectively. In this model 4% of Lack of Family Support and 22% of Perceived Control were present in the model.

Overall variance in Anxiety and depressive symptoms explained by this model was 18% and 28% respectively.

Although Child Temperamental Vulnerabilities was found to fully mediate the relationship between Parent Vulnerabilities and Lack of Family Support (path coefficients .08, ns when Pvul/Chtemp correlated and .16,  $cr$  2.2 when Chtemp constrained), Lack of Family Support did not mediate the relationship between Chtemp and PC. Perceived Control however did fully mediate the relationship between Lack of Family Support and both Anxious (path coefficients .011, ns when LFS/PC correlated and .26,  $cr$  3.4 when PC constrained) and depressive symptoms (path coefficients .07, ns when LFS/PC correlated and .31,  $cr$  4.6 when PC constrained). Separately, Child Temperamental Vulnerabilities fully mediated the relationship between Parental Vulnerabilities and Anxious Symptoms (path coefficients .05, ns when Pvul/Chtemp correlated and .20,  $cr$  2.9 when Chtemp constrained) but did not mediate the relationship between Parental Vulnerabilities and depressive symptoms. This model differs from the others in the direct paths from Child Temperament influenced by Parent Vulnerabilities to Anxious and depressed symptoms. It appears that neither perceived control nor family support can protect a child from anxious or depressed symptoms as fully as the combination of other factors in the model.

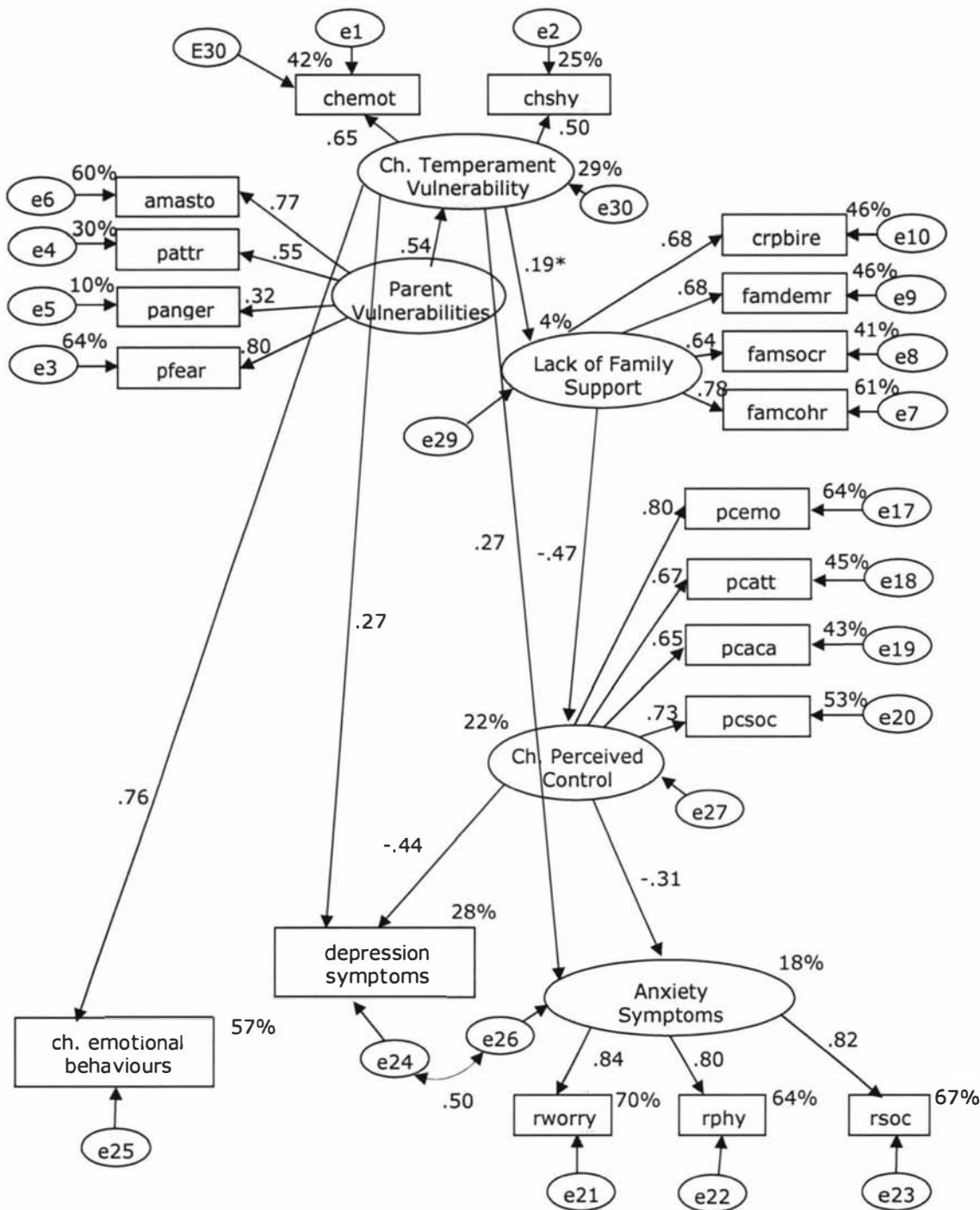


Figure 13.7. Path Diagram of the Complex Model of Distress Development with Lack of Family Support as Family Factor and Perceived Control as Mediator. *chemot* = child emotionality. *chshy* = child shyness. *pfear* = parent fearfulness. *pattr* = parent relationship security (reverse scored). *panger* = parent anger. *amasto* = total adult manifest anxiety schedule. *famcohr* = family cohesion (reverse scored) *famsocr* = family sociability (reverse scored). *famdemr* = family democratic style (reverse scored). *crpbire* = parent rejection. *pcemo* = perceived emotional control. *pcatt* = perceived attachment control. *pcaca* = perceived academic control. *pcsoc* = perceived social control. *rworry* = RCMAS worry. *rphy* = RCMAS physiological anxiety. *rsoc* = RCMAS social concerns. *cdito* = depressive symptoms (CDI-S total). % = percent of indicator or factor variance explained. All parameter values are standardised. All parameters  $p < .001$  except one \*  $p < .05$ .

### **13.3.2.9. Lack of Family Support as the Family Factor and Perceived Competence as the Cognitive Factor**

When perceived competence was substituted for perceived control in the Figure 13.7 model (see Figure 13.8), fit indices were more favourable (GFI .94, CFI .96, RMSEA .042 (*pclose* .86, AIC 250.6). Using Perceived Competence in place of Perceived Control, there were no longer direct paths between Child Temperamental Vulnerabilities and Anxiety and depressive symptoms nor was the correlation between depressive and Anxiety Symptoms significant. As with the previous model, Chtemp explained a substantial 59% (.77) of the variance in CEB. Parent Vulnerabilities explained 30% (.55) of the variance in Child Temperamental Vulnerabilities. Child Temperamental Vulnerabilities accounted for 10% (-.31) of the variance in Perceived Competence and 4% (.19) of the variance in Lack of Family Support. Lack of Family Support explained 12% (-.35) of the variance in Pcomp, while Pcomp explained 58% (-.76) of the variance in Anxiety Symptoms and explained 48% (-.69) of the variance in depressive symptoms. As with Perceived Control in a previous model (see Figure 13.7.), Child Temperamental Vulnerabilities fully mediated the relationship between Parental Vulnerabilities and Lack of Family Support (path coefficients of .1, ns when Pvul/Chtemp correlated and .17, *cr* 2.3 when Chtemp constrained).

In this model, however, Lack of Family Support partially mediated the relationship between Chtemp and Perceived Competence (path coefficients of -.31, *cr*-3.9 when Chtemp/LSF correlated and -.38, *cr* -4.5 when LSF constrained). Then, Child Perceived Competence fully mediated the relationship between Lack of Family Support and Anxious Symptoms (path coefficients of -.00, ns when Pcomp/LSF correlated and .33, *cr* 4.5 when Pcomp constrained) and between Lack of Family Support and depressive symptoms (path coefficients of .12, ns when Pcomp/LFS correlated and .40, *cr* 5.7 when Pcomp constrained). Child Perceived Competence also fully mediated the relationship between

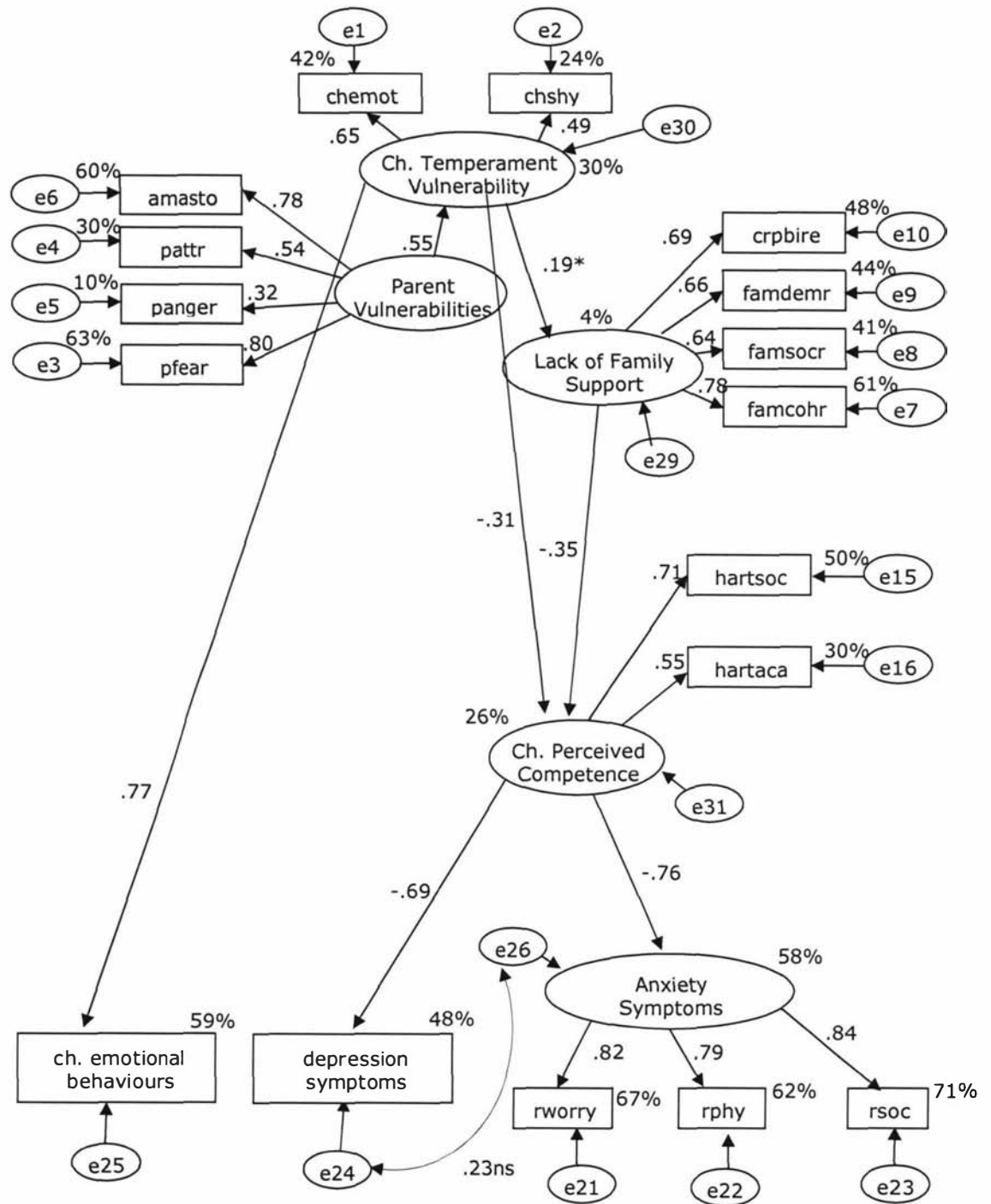
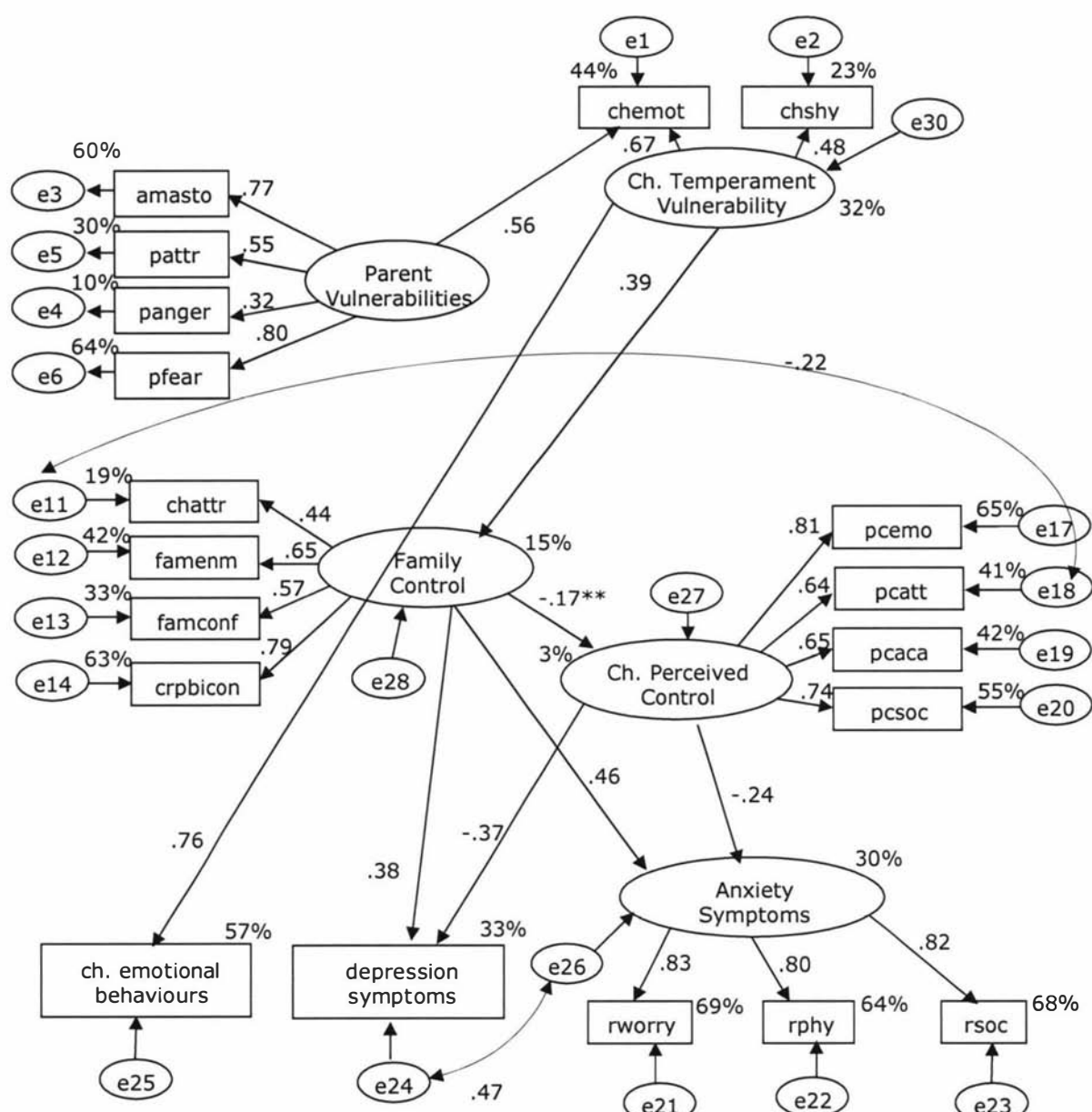


Figure 13.8. Path Diagram of the Complex Model of Distress Development with Lack of Support as Family Factor and Perceived Competence as Mediator. chemot = child emotionality. chshy = child shyness. pfear = parent fearfulness. pattr = parent relationship security (reverse scored). panger = parent anger. amasto = total adult manifest anxiety schedule. famcohr = family cohesion (reverse scored) famsocr = family sociability (reverse scored). famdemr = family democratic style (reverse scored). crpbire = parent rejection. hartsoc = perceived social competence. hartaca = perceived academic competence. rworry = RCMAS worry. rphy = RCMAS physiological anxiety. rsoc = RCMAS social concerns. cdito = depressive symptoms (CDI-S total). % = percent of indicator or factor variance explained. All parameter values are standardised. All parameters  $p < .001$  except one \* $p < .05$  Child Temperament Vulnerabilities (Chtemp) and Anxiety (path coefficients of .08, ns when Pcomp/Chtemp correlated and .38 cr 4.2 when Pcomp constrained) and depressive symptoms (.12, ns when Pcomp/Chtemp correlated and .38 cr 4.6 when Pcomp constrained).

Comparing the two Lack of Family Support models with different cognitive mediators (i.e., Perceived Control in Figure 13.7 and Perceived Competence in Figure 13.8.), it appeared that, with data from the present sample, perceived competence was more effective at mediating between this family environmental vulnerability and the child's temperamental nature and anxiety and depression. Also, the path coefficients from LFS to Pcomp and from Pcomp to both Anxiety and depression were considerably stronger than from LFS to PC and from PC to both anxiety and depression. Additionally, with Perceived Competence in the model, more of the total variance in Anxiety (58% vs. 18%) and depression (48% vs. 28%) was accounted for (Figure 13.8 cf. 13.7). However, the contribution of Lack of Support remained small in both models (4%). The next investigation compares how Family Control relates to the cognitive factors individually.

#### **13.3.2.10. Family Control as Family Environment Factor and Perceived Control as the Cognitive Factor**

Fit indices for this model (see Figure 13.9) were: GFI .93 CFI .95 RMSEA .044 *p*close .83 AIC 316.2. Parent Vulnerabilities explained 31% (.56) of the variance in Child Temperament while Child Temperament accounted for 15% (.39) of variance in Family Control. Family Control accounted for 3% (-.17) of variance in Perceived Control and directly accounted for 21% (.46) of variance in Anxiety and 14% (.38) depression symptoms. Perceived Control accounted for 6% (-.24) of variance in Anxiety and 14% (-.37) in depression. Overall the model explained 30% of the variance in Anxiety and 33% in depression.



**Figure 13.9.** Path Diagram of the Complex Model of Distress Development with Family Control as Family Factor and Perceived Control as Cognitive Mediator. chemot = child emotionality. chshy = child shyness. pfear = parent fearfulness. pattr = parent relationship security (reverse scored). panger = parent anger. amasto = total adult manifest anxiety schedule. pemo = perceived emotional control. pcatt = perceived attachment control. pcaca = perceived academic control. pcsoc = perceived social control. chattr = child relationship security (reverse scored). famenm = family enmeshment. famconf = family conflict. crpbicon = parental psychological control. rworry = RCMAS worry. rphy = RCMAS physiological anxiety. rsoc = RCMAS social concerns. cdito = depressive symptoms (CDI-S total). % = percent of indicator or factor variance explained. All parameter values are standardised. All parameters  $p < .001$  except one where  $**p < .01$ .

In this model, Family control did not mediate the relationship between Child Temperament and Perceived Control, but it did partially mediate the relation between Child Temperament and Anxiety (path coefficients .15 cr

2.1 when Chtemp/FC correlated and .30 cr 4.1 when FC constrained) and depression symptoms (path coefficients .18 cr 2.8 when Chtemp/FC correlated and .30 cr 4.5 when FC constrained). Perceived Control partially mediated the relationship between Family Control and both Anxiety (path coefficients .46 cr 6.2 when FC/PC correlated and .52 cr 6.6 when PC constrained) and depressive symptoms (path coefficients .38 cr 5.9 when FC/PC correlated and .47 cr 6.4 when PC constrained).

This model is now compared with a model with Family Control is the family factor and Perceived Competence is the cognitive factor.

#### **13.3.2.1.1. Family Control as Family Environment Factor and Perceived Competence as the Cognitive Factor**

Fit indices for this model were better than all other models: GFI .94 CFI .97 RMSEA .037 *pclose* .95 AIC 237.6 (See Table 13.5 and Figure 13.10). Compared to the previous model (Figure 13.9), Parent Vulnerabilities explained the same amount of variance in Child Temperament (31%, path coefficient .56) and Child Temperament explained the same amount of variance in Family Control (15%, coefficient .39). Family Control explained more variance in Perceived Competence (25%, coefficient -.50) than in Perceived Control in the previous model (3%). Perceived Competence explained more variance in Anxiety (64%, coefficient -.80 vs. 6%) and in depression (49%, coefficient -.70 vs. 14%). Child Temperament also explained 4% (-.2) of the variance in Perceived Competence.

Family Control partially mediated the relationship between Child Temperament and Perceived Competence (path coefficients -.21 cr -2.7 when Chtemp/Pcomp correlated and -.41 cr -4.7 when FC constrained). Perceived Competence fully mediated the relationship between Family Control and both Anxiety (path coefficients .16 ns when FC/Pcomp correlated and .59 cr 6.6 when Pcomp constrained) and depressive symptoms (path coefficients .15 ns when FC/Pcomp correlated and .53 cr

6.4 when Pcomp constrained). It also fully mediated the relationship between Child Temperament and Anxiety (path coefficients .04 ns when Chtemp/Pcomp correlated and .41 cr 4.3 when Pcomp constrained) and depressive symptoms (path coefficients .09 ns when Chtemp/Pcomp correlated and 40 cr 4.6 when Pcomp constrained).

This model explained more overall variance in Anxious (64% vs. 30%) and more in depressive symptoms (49% vs. 33%) than the previous model with Perceived Control as mediator. Considerably more of Perceived Competence was represented in the model this time than Perceived Control in the previous one (36% vs. 3%) (see Figure 13.9). This model is suggesting that in the face of parent-reported individual vulnerabilities and parent-reported child temperament vulnerabilities, and with a child-reported family environment containing psychological control, enmeshment, conflict and attachment-related insecurity, a child's perceived competence can protect that child from experiencing anxious or depressive symptoms (see Chapter 14). It appears that the combination of Family Control and Perceived Competence accounts for more variance in Anxiety and depressive symptoms than any other model assessed to this point. However, it is noted that Perceived Competence contributes less to the model than when Perceived Control is the cognitive mediator (see Figure 13.6).

To summarise the models in Figures 13.3. through 13.10., the two family environment latent variables appeared to relate slightly differently to each cognitive mediator (see Figures 13.3. and 13.4.) and more variance in the criterion variables was generally explained when both family environment variables were used (see Figures 13.3. & 13.4 cf. 13.7. & 13.9, 13.8. & 13.10). The only exception was when Family Control and Perceived Competence were combined in a model (Figure 13.10). In addition, the cognitive variables related differently to both family factors and to criterion variables, Anxious and depressive symptoms.

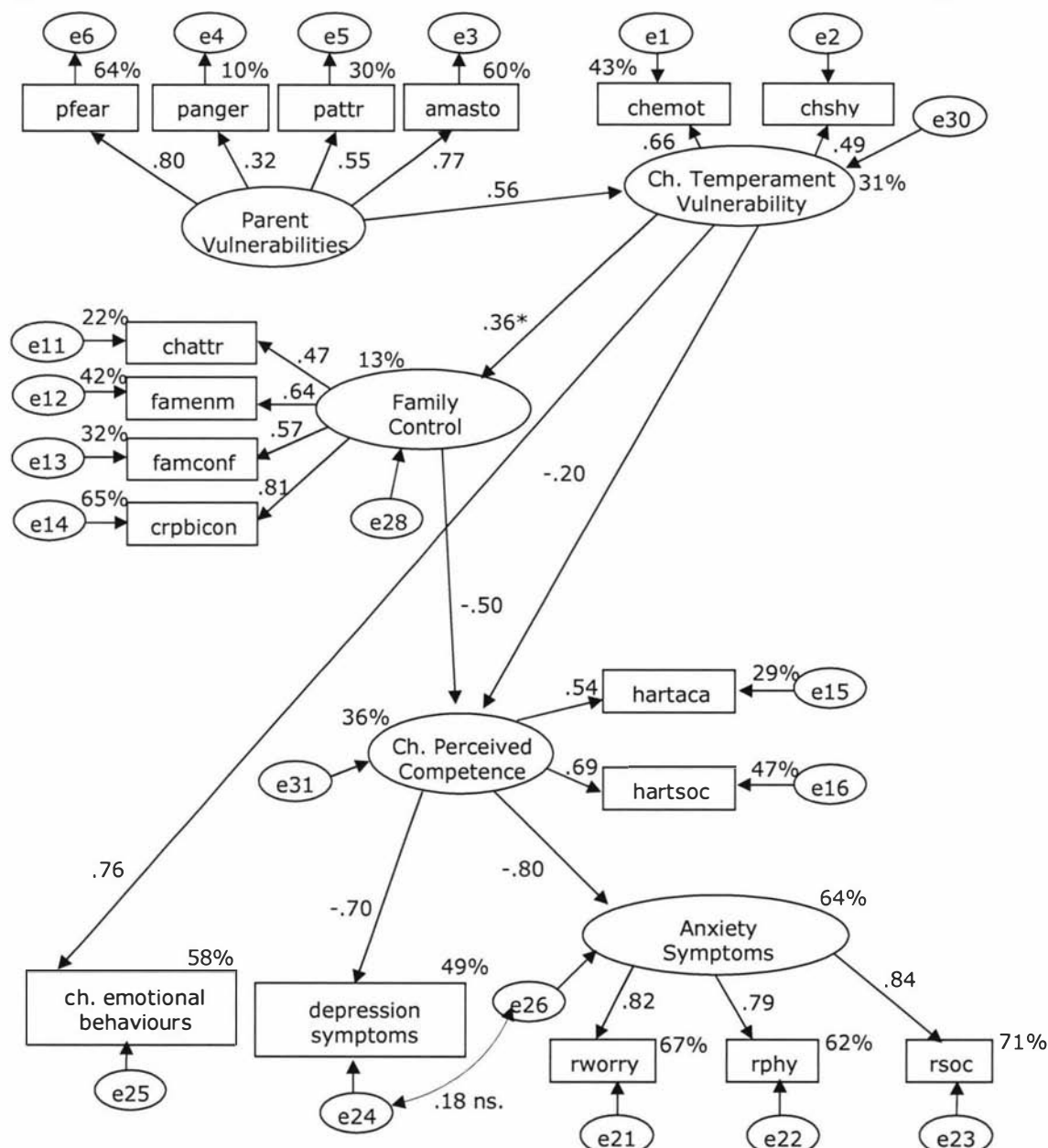


Figure 13.10. Path Diagram of the Complex Model of Distress Development with Family Control as Family Factor and Perceived Competence as Cognitive Mediator. chemot = child emotionality. chshy = child shyness. pfear = parent fearfulness. pattr = parent relationship security (reverse scored). panger = parent anger. amasto = total adult manifest anxiety schedule. hartsoc = perceived social competence. hartaca = perceived academic competence. pcatt = perceived chattr = child relationship security (reverse scored). famenm = family enmeshment. famconf = family conflict. crpbicon = parental psychological control. rworry = RCMAS worry. rphy = RCMAS physiological anxiety. rsoc = RCMAS social concerns. cdito = depressive symptoms (CDI-S total). % = percent of indicator or factor variance explained. All parameter values are standardised. All parameters  $p < .001$  except one where  $*p < .01$ . ns = not statistically significant to  $p < .05$ .

For these and a priori reasons, combining the variables into one model was thought to have the potential to explain further the relationship

between cognitive, biological and environmental vulnerabilities and distress.

#### **13.3.2.1.2. Combining All Constructs in a Complex Biopsychosocial Model of Vulnerability and Protection**

As discussed in the introduction chapters, Perceived Control (PC) and Perceived Competence (PComp) have differing roles in relationship to the other constructs in the model perhaps because of their definitions in the measures used (PC being a within-person estimation of perceived control and PComp being a sense of being competent compared to peers) and therefore may function differently as cognitive mediators. As well, in these models, PC and Pcomp are defined by different indicator variables. While PC is defined according to control over emotions, over getting help from others, over the desire to connect socially and perform academically, Pcomp is defined in terms of how children see themselves performing socially and academically in comparison with their peers. Further the marker variables differ, with the marker for PC being emotional control and the marker of Pcomp being social competence. Hence, in order to observe how the mediators performed together, it was important to risk stretching the parameter-to-participant ratio (i.e., now 25 observed variables, 66 parameters to estimate and a subject-to-parameter ratio of 4.5:1, which approximated but fell slightly short of the 5:1 ratio recommended by Tabachnick & Fidell, 2001). The major consequence of a lower ratio is a potential underestimation of parameters (Hoyle, 1995). A final model was estimated including both PC and PComp as cognitive mediators and is presented in Figure 13.11. As with previous models (i.e., measurement model, Tables 13.4 & 13.5. and Figures 13.3., 13.4, 13.5.), theoretically supported correlations of error terms were allowed with social control correlating with the social competence, academic control correlating with academic competence, family conflict correlating with lack of family cohesion and child attachment-related security correlating with attachment control. In this model, as with the models

including Perceived Control but not Perceived Competence, depression symptoms and Anxiety Symptoms were also significantly correlated.

The fit indices for this final complex model were adequate with GFI .90, CFI .93, RMSEA .049 *p*close .57 and AIC 581.6 indicating that it could not be rejected as a possible model. As with previous models Parent Vulnerabilities explained 30% (.56) of the variance in Child Temperament. Child Temperament explained 13% (.37) of the variance in Family Control, and 3% (-.18) of the variance in Perceived Competence and 58% (.76) of the variance in parent-reported child emotional behaviours. Family Control accounted for 19% (-.44) of the variance in Perceived Competence and 14% (.37) of the variance in Lack of Family Support. Lack of Family Support accounted for 22% (-.47) of the variance in Perceived Control and Perceived Control accounted for 24% (.49) of the variance in Perceived Competence. Only Perceived Competence accounted for variance in Anxiety Symptoms (51%, path coefficient -.71) and in depressive symptoms (49%, path coefficient, -.70). As with previous models, neither cognitive construct accounted for variance in child emotional behaviours. In this model, 14% of Lack of Family Support, 13% of Family Control, 22% of Perceived Control and 61% of Perceived Competence was represented in the model. Overall, this model also explained 51% of Anxiety and 49% of depression symptoms.

With both cognitive mediators present, a number of chains of mediating effects were observed which together accounted for similar variance in Anxious and depressive symptoms (51% and 49%, respectively). With these, the cognitive factors mediated the relationship between the biological and psychological adversity and distress symptoms. The longest chain showed all factors in the model fully mediating the relationship between adversity and distress. This was as follows: Child Temperamental Vulnerabilities fully mediated the relationship between Parent Vulnerabilities and Family Control (path coefficients .12, ns when Pvul/Chtemp correlated and .28, *cr* 3.8 when Chtemp constrained);

Family Control fully mediated the relationship between Child Temperamental Vulnerabilities and Lack of Family Support (path coefficients  $-.08$ , ns when Chtemp/FC correlated and  $.21$ ,  $cr$   $2.7$  when FC constrained). Lack of Family Support fully mediated the relationship between Family Control and Perceived Control (path coefficients  $-.02$ , ns when LFS/FC correlated and  $-.22$ ,  $cr$   $-2.8$  when LFS constrained). Perceived Control fully mediated the relationship between Lack of Family Support and Perceived Competence (path coefficients  $-.04$ , ns when LFS/PC correlated and  $-.34$ ,  $cr$   $-4.0$  when PC constrained). Finally, Perceived Competence fully mediated the relationship between Perceived Control and both Anxiety (path coefficients  $-.15$ , ns when Pcomp/PC correlated and  $-.33$ ,  $cr$   $-4.5$  when Pcomp constrained) and depressive symptoms (path coefficients  $-.08$ , ns when Pcomp/PC correlated and  $-.46$ ,  $cr$   $-7.0$  when Pcomp constrained) forming a chain of influence on Anxiety and depressive symptoms that would fit well with Barlow's model.

The biological vulnerabilities related to the distress symptoms more directly in two other ways: one through Perceived Competence and the other through both Family Control and Perceived Competence. Again, Pcomp fully mediated the relationships between adversity and distress. With the first path, although the relationship between Parent Vulnerabilities and Perceived Competence was not mediated by Child Temperamental Vulnerabilities (path coefficients  $.0$ , ns when LFS/FC correlated and  $-.12$ , ns when LFS constrained), the relationships between Child Temperamental Vulnerabilities and Anxiety and depressive symptoms were fully mediated by Perceived Competence (to Anxiety, path coefficients  $.1$ , ns when Chtemp/Pcomp correlated and  $.38$ ,  $cr$   $4.4$  when Pcomp constrained and to depressive symptoms, path coefficients  $.1$ , ns when Chtemp/Pcomp correlated and  $.37$ ,  $cr$   $4.7$  when Pcomp constrained). These relationships were not seen in the model with Perceived Competence as the only cognitive mediator and both family environment constructs present (Figure 13.4).

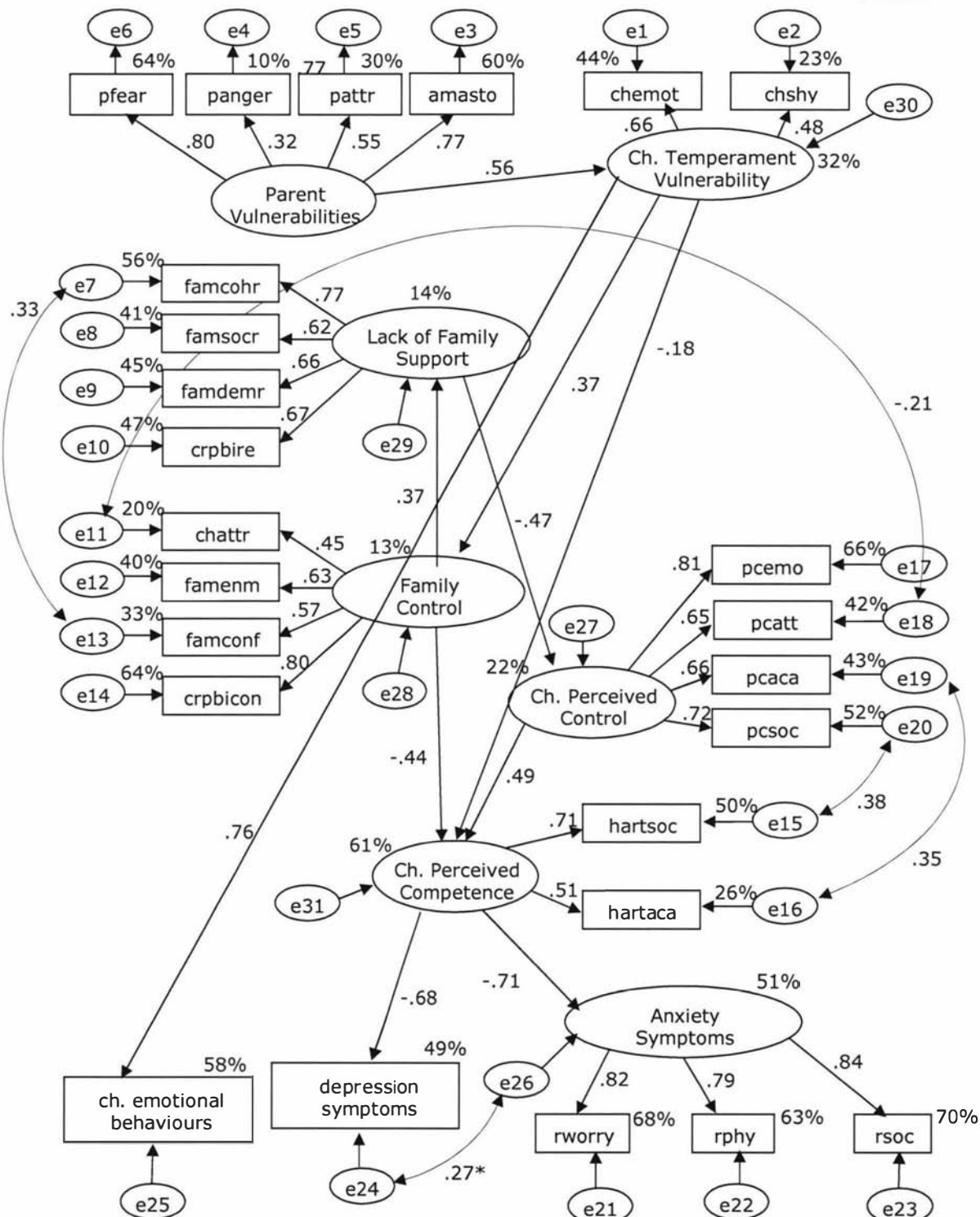


Figure 13.11. Path Diagram of the Final Complex Model of Distress Development with Perceived Control and Perceived Competence as Cognitive Mediators. chemot= child emotionality. chshy= child shyness. pfear = parent fearfulness. pattr= parent relationship security (reverse scored). panger= parent anger. amasto= total adult manifest anxiety schedule. famcohr= family cohesion (reverse scored) famsocr= family sociability (reverse scored). famdemr= family democratic style (reverse scored). crpbire= parent rejection. hartsoc= perceived social competence. hartaca= perceived academic competence. pchemo= perceived emotional control. pcatt= perceived attachment control. pcaca= perceived academic control. pcsoc= perceived social control. chattr= child relationship security (reverse scored). famenm= family enmeshment. famconf= family conflict. crpbicon= parental psychological control. rworry= RCMAS worry. rphy= RCMAS physiological anxiety. rsoc= RCMAS social concerns. cdito= depressive symptoms (CDI-S total). %= percent of indicator or factor variance explained. All parameter values are standardised. All parameters  $p < .001$  except one where  $*p < .05$ .

With the second path, Child Temperamental Vulnerabilities did fully mediate the relationship between Parent Vulnerabilities and Family Control (.12 ns; .28, cr 3.8); Family Control partially mediated the relationship between Child Temperamental Vulnerabilities and Perceived Competence (-.18, cr.-2.5; -.37, -4.9) and finally, Perceived Competence fully mediated the relationship between Family Control and Anxiety (path coefficients .21, ns when Pcomp/FC correlated and .58, cr 6.9 when Pcomp constrained) and fully mediated the relationship between Family Control and depressive symptoms (path coefficients .45, ns when Pcomp/FC correlated and .54, cr 6.8 when Pcomp constrained).

This final complex biopsychosocial model has presented information to suggest that a sense of control over one's emotions, over attachment to others as well as having perceptions of control over social interactions and academic endeavours could be influential in creating a sense of social and academic competence that may protect a child from having Anxious or depressive symptoms occur despite biological and environmental adversity. The data support the notion that separately these cognitive constructs, especially perceived competence, may be useful in protecting the child from distress in the presence of one or other of the environmental family influences but together they appear to provide a strong barrier to distress for latency aged school children. To varying degrees, both Perceived Control and Perceived Competence have supported their hypothesised roles as cognitive mediators between adversity and Anxiety and depressive symptoms. However, these mediation effects were not seen for parent-reported child emotional behaviours. Here, parent-reported child emotional behaviours consistently related strongly and directly to parent-reported child temperamental vulnerabilities which were influenced by parent-reported Parent Vulnerabilities.

### **13.3.3. Comparing the Complex Biopsychosocial Model with a Theoretical Alternative**

Finally, the hypothesised Complex Biopsychosocial Model with all constructs represented was tested against a theoretically alternative model (see Figure 13.12). This alternative model, where all constructs influenced the criterion variables independently, represents a theory counter to the one proposed (i.e., the proposed one being that the predictor variables operate through cognitive mediators). It was particularly chosen because it addressed two relevant questions posed by the present investigation. These were whether biological vulnerabilities were mediated by environmental vulnerabilities and whether both were mediated by cognition in relation to their effect on distress symptoms or whether they relate to distress symptoms independently. As mentioned, it was likely that a number of good-fitting, equally plausible, alternative models could be generated from the present data. Additionally, the likelihood of bi-directionality of effects, within the model presented, created even more plausible alternatives. Therefore, this model displaying a counter-prediction to the theory being tested was presented for comparison in Figure 13.12.

In this model, all predictor factors: biological vulnerabilities, family environment vulnerabilities and cognitive vulnerabilities were constrained to have independent influences on Anxious, depressive symptoms and child emotional behaviour. Those predictor factors which shared method (either parent-report or child-report) were allowed to correlate. Perceived competence and perceived control were allowed to correlate according to Weisz's theory (see Section 10.7.2.). As with the other models presented, nonsignificant paths were individually and systematically eliminated from the model starting with the elimination of the path with the lowest critical ratio value and then re-estimating the model after each subsequent elimination of a nonsignificant path. Overall, fit indices of the resulting model suggested poor fit with GFI .83, CFI .82, RMSEA .08, *pclose* .00. The alternative model explained 36% of the variance in Anxiety and 39% of the variance in depressive symptoms. Since the Final

Complex Biopsychosocial Model and the Alternative Model were not nested, the traditional chi square difference test could not be used to compare them. Therefore the AIC was again used to compare the models. The AIC for the hypothesised and alternative models were 551.3 and 832.1 respectively suggesting superior fit of the hypothesised model compared to the alternative. Hence, while it was possible to reject the alternative suggestion that all vulnerabilities had a direct effect on distress, it was not possible to reject a model where environmental risk mediated biological risk in relation to distress and where perceived control and perceived competence mediated the relationship between biological and psychological vulnerabilities and the development of anxious and depressive symptoms.

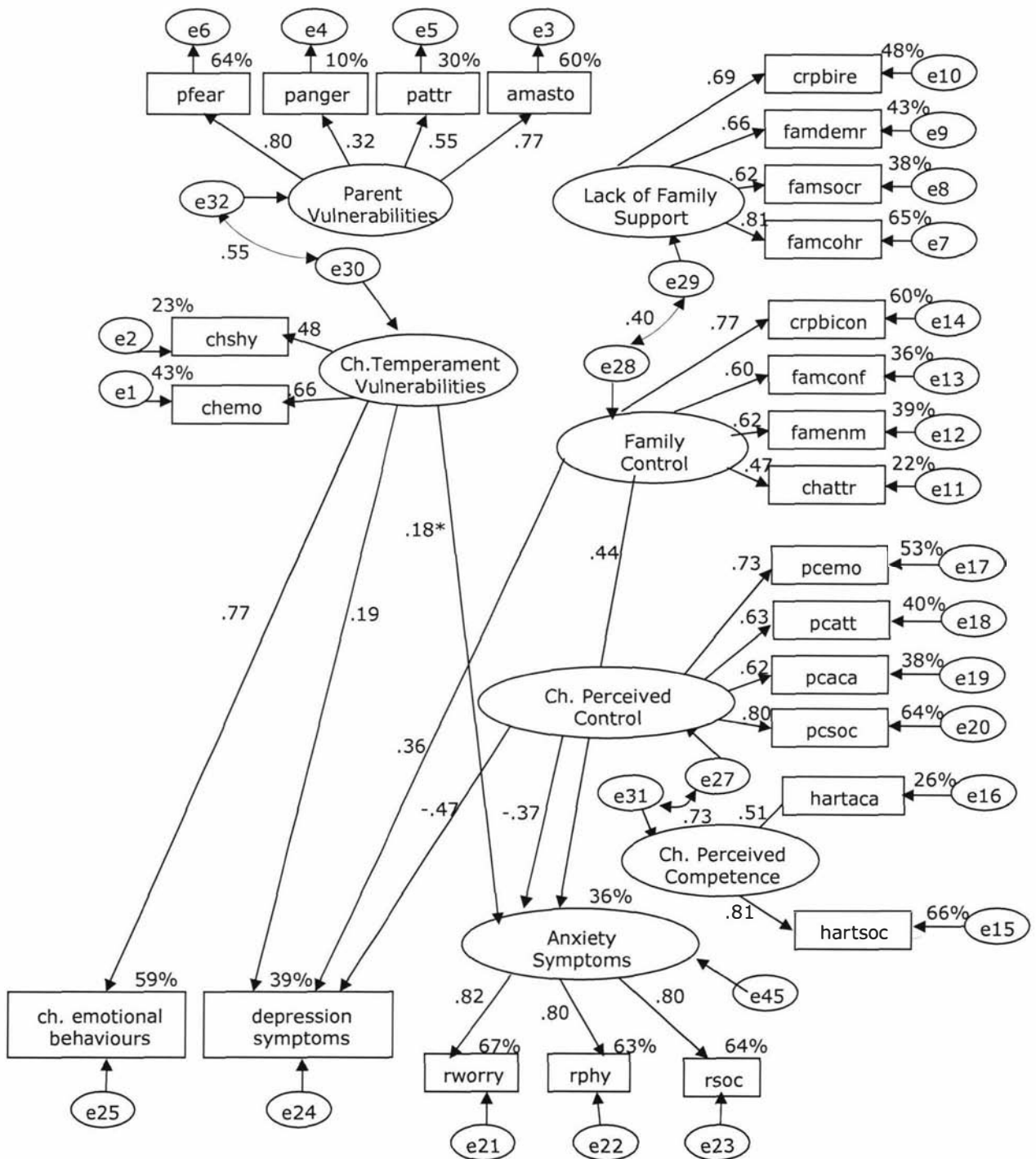


Figure 13.12. Theoretical Alternative to the Final Complex Model of Distress Development. Chemot =child emotionality, chshy =child shyness, pfear =parent fearfulness, pattr =parent relationship security (reverse scored), panger =parent anger, amasto =total adult manifest anxiety schedule, famcohr =family cohesion (reverse scored), famsocr =family sociability (reverse scored), famdemr =family democratic style (reverse scored), crpbire =parent rejection, hartsoc =perceived social competence, hartaca =perceived academic competence, pcemo =perceived emotional control, pcatt =perceived attachment control, pcaca =perceived academic control, pcsoc =perceived social control, chattr =child relationship security (reverse scored), famenm =family enmeshment, famconf =family conflict, crpbicon =parental psychological control, rworry =RCMAS worry, rphy =RCMAS physiological anxiety, rsoc =RCMAS social concerns, cdito =depressive symptoms (CDI-total), % =percent of indicator or factor variance explained. All parameter values are standardised. All parameters  $p < .001$  except one where  $* = p < .05$ .

### 13.4. Summary of Findings

A summary including all reported model fit indices and comments pertaining to aspects of each model is presented in Table 13.5. Keeping in mind that fit indices (except RMSEA/*pclose*) reward parsimony and penalise sample size, all models presented complied with fit criteria which would not indicate rejection of the model. As mentioned in Chapters 11, only research design (i.e., longitudinal but not cross-sectional design) and not statistical method (SEM) is able to more conclusively support direct causation. With the present study being a cross-sectional design, it is not possible to ascribe direct cause to relationships. Also using SEM, when a model fits the data set used, this does not make the model right or acceptable on the basis of statistical analysis as many other statistical and theoretically plausible models could be created from any data set. The most that can be said is that the model can not be rejected as possible based on the fit statistics (Hoyle, 1995; Ullman, 2001). That said, a better fit does suggest increased plausibility.

The models that fitted the present child school sample data best and accounted for the most total variance in the criterion variables were the complex models that included perceived competence as the cognitive mediator (Figure 13.4., 13.6, 13.8, 13.10) and the final model that included both cognitive mediators (Figure 13.11). The final model showed how the mediators related and presented a closer representation of Barlow's theory than any of the others. As it would seem that a feeling of competence would be harder to attain than a sense of control, this model may be the most useful in a practical sense to inform intervention strategies. This topic is considered further in the Discussion.

**Table 13.5****Fit Statistics for the Models**

Model	Fit Statistics					Comments
	GFI	CFI	RMSEA	pclose	AIC	
Tables 13.3. & 13.4. Confirmatory/Measure Model	.90	.91	.058	.049	597.3	Reasonable fit for a large model
Fig. 13.1. Replicated Model using more specific child perceived measures (except Ch. Emotional Behaviour)	.92	.91	.09	.00	193.4	Generally supports Chorpita et al. (1998) mediation Model—partial mediation Variance in A 11%, dep 30%
Fig. 13.1a. (in Appendix D) Replicated Model using parent Family Control variable	.95	.96	.07	.05	122.8	No shared child method variance—full mediation found Variance in A 10%, dep 20%
Fig. 13.2. Replicated Model with Child Temperament Vulnerability	.94	.95	.06	.14	184.9	Partial support for Barlow (2002); PC partially mediated FC→dep, not Anx.; FC fully mediate Chtemp→A & D Variance in A 49%, dep 58%
Fig. 13.3. Complex Model with Perceived Control as Cognitive Mediator	.91	.93	.49	.57	486.4	One full mediation chain from Pvl to Anx & dep through Chtemp, FC, LFS, PC; one partial thru FC to Anx and dep. Variance in Anx 30%, dep 32%
Fig. 13.4. Complex Model with Perceived Comp. cf. Fig. 5	.92	.94	.044	.83	385.5	Two part mediation chains to Anx & dep. Variance in Anx 63%, dep 51%
Fig. 13.5 Lack of Family Support Model with Perceived Control and Competence	.91	.94	.05	.4	419.9	PC & Pcomp fully mediated betw. LFS & Anx & Dep. Variance in A 46%, dep 46%
Fig. 13.6 Family Control both PC and Pcomp	.92	.94	.048	.65	401.9	Pcomp more influential as cognitive mediator Variance in Anx 59%, dep 48%
Fig. 13.7. Lack of Family Support Model with Perceived Control	.92	.95	.042	.6	332.8	Full mediation from LFS thru PC to Anx & dep, but LFS not related to biological vulnerabilities; direct paths from Chtemp to Anx & dep; Chtemp mediated Pvl→Anx, not dep. Variance in Anx 18%, dep 28%
Fig. 13.8. Lack of Family Support Model with Perceived Competence	.94	.96	.042	.86	250.6	Pcomp fully mediated from Pvl & Chtemp to Anx & dep; partially from Pvl & Chtemp thru LFS; no direct paths to Anx & Dep from Chtemp Variance in A 58%, dep 48%
Fig. 13.9 Family Control and Perceived Control	.93	.95	.044	.83	316.2	Partial mediation Variance in Anx 30%, dep 33%
Fig. 13.10. Family Control and Pcomp	.94	.97	.037	.95	237.6	Explains most variance of all models in distress symptoms Variance in A 64%, dep 49%
Fig. 13.11. Hypothesised Final Complex Model	.90	.93	.049	.57	581.6	Reasonable fit given complex relationships—PC and Pcomp mediated various vulnerabilities Variance in Anx 51%, dep 49%
Fig. 13.12. Alternative Model	.83	.82	.08	.00	832.1	Not good fit variance in Anx 36%, dep 39%

*Note.* GFI = goodness of fit index; CFI = comparative fit index; RMSEA = root mean square error of approximation; *pclose* = test for close fit (RMSEA<.05); AIC = Akaike's Information Criteria, PC = Perceived Control, Pcomp = Perceived Competence, LFS = Lack of Family Support, CF = Controlling Family Environment, Pvl = Parent Vulnerabilities, Chtemp = Child Temperamental Vulnerabilities, Anx. or A= Anxious Symptoms, dep. = Depressive Symptoms.

## **CHAPTER 14**

### **DISCUSSION**

#### **14.1. Chapter Overview**

This chapter presents a discussion of the results of the present study, how these findings relate to the theory and research of others and how they might contribute practically to identification, intervention and prevention strategies concerning distress in children. A brief summary of the major findings of the study is followed by a more detailed discussion of results. This begins with a discussion of the replications of the empirical model (Chorpita, Brown & Barlow, 1998) and the theoretical model (Barlow, 2002) and is followed by a more detailed discussion of the multifactor biopsychosocial risk model developed in the current study. The discussion includes how the cognitive factors relate to each other and to the other vulnerabilities—temperamental, parent relational, and family vulnerabilities and how they apply to other research and theory. The role of the family factors is likewise discussed. Following this, there is a consideration of the implications of the findings for Barlow's (2000, 2002; Chorpita, 2001; Chorpita & Barlow, 1998) model and the extent to which the present model extends that model to incorporate other theories. The chapter concludes with a discussion of the implications for intervention, the study's strengths and limitations and suggestions for additional research.

#### **14.2. Summary of Major Study Findings**

The current study fulfilled three primary objectives towards delineating a biopsychosocial aetiological risk model of distress disorder development for children in middle childhood. The first objective was to specify and evaluate for fit and mediation effects, a model first assessed by Chorpita, Brown and Barlow (1998). Using more specific measures for parental

control and perceived control and a New Zealand school sample of children in middle childhood, the present study found that control-related perceptions partially mediated the relationship between parental control and the development of distress symptoms. This only partially replicated the original study's findings where control-related perceptions fully mediated the relationship between parental control and distress (Chorpita et al., 1998). Additionally, the model in the original study accounted for more variance in negative affectivity than did the present study, even when the criterion variables were combined in a single factor to more fully replicate the original study (see Appendix D, note 1a). By contrast, a full mediation effect was found when using parent-reports of parental control, confirming that self-report was not the sole reason for the cognitive variables appearing to at least partially protect children from developing anxious or depressive symptoms.

A second expanded model representing Barlow's (2002) general biological and psychological vulnerabilities was specified and evaluated for fit and mediation effects. This second model incorporated child general biological risks, child general psychological risks (parent control) and associated cognitive risk hypothesised to be salient for the development of childhood distress disorders (Barlow, 2002; Chorpita, 2001; Chorpita & Barlow, 1998). Again, overall, the model fit adequately and the cognitive construct of perceived control displayed a partial mediational role, again partly supporting the theory. That is, in the presence of child temperamental vulnerability, perceived control did not protect a child from anxiety but did partly protect a child from depressive symptoms. In addition, in keeping with Barlow's theory, perceived parental control fully mediated the relationship between child temperament and both anxious and depressed feelings. Also the addition of a child temperament factor increased the amount of variance explained in both anxious and depressed symptoms.

Third, a more comprehensive biopsychosocial risk model of distress disorder aetiology which introduced more relational, family and cognitive

factors from other theories was specified and evaluated for fit and mediating effects. This model included parent-reported child biological risk and parent psychological risk, two child-reported family risk factors and two child-reported cognitive risk factors in addition to the criterion variables of child-reported anxiety and depressive symptoms and parent-reported ratings of child emotional behaviours. Generally, the data supported the hypothesis that a prototypical child with a shy, anxiety-prone temperament, living with a primary caregiver who was vulnerable to be fearful, anxious, insecure and angry, in a controlling, unsupportive family environment where the child had a reduced experience with personal control would be more likely to have a perception of low control and competence and would in turn be more likely to report anxious and/or depressive symptoms. Overall, results from the most inclusive biopsychosocial model indicated that perceptions of control and competence in combination were able to protect (i.e., full mediation) this child from developing distress symptoms. While models with the combination of perceived control and perceived competence accounted for more variance in child-reported distress than did models with perceived control alone, models with perceived competence as the cognitive mediator tended to explain more overall variance in the criterion variables. Likewise, models with family control explained more variance in child-reported distress than did models with lack of family support. Hence, the model with family control as the family environmental factor and perceived competence as the cognitive factor explained more variance in child distress than any of the other models.

Finally, when compared with another theoretically viable model, the most inclusive complex mediation model showed superior fit. Therefore, while the first two replication models partially supported the study hypotheses (see Section 11.4), the more complex biopsychosocial risk model tended to provide stronger support for the hypotheses. That is, in all models, the cognitive factors offered at least partial protection for child-perceived distress. Also, the addition of perceived competence tended to explain

more variance in distress symptoms than was explained in the original Chorpita et al. (1998) study.

Different from the Chorpita et al. (1998) study where the criterion variables were included in one factor, the present study separated anxious from depressive symptoms. This was because the present data better supported a tripartite model (Clark & Watson, 1991; see also Chapter 3). The commonality between the anxiety factor and depression indicator was represented by correlated error terms. Numerous previous studies using school and clinical populations of children also support this model (e.g., Chorpita, Albano et al., 1998; Chorpita, Plummer & Moffitt, 2000; Clark et al., 1994; Joiner et al., 1996; Lonigan et al., 1999).

The findings of the present study lent support to several other theoretical models which are in many ways consistent with each other (for one exception see Section 14.5.3.). These include Bowlby's theory (1988) of how anxiety and depression develop from an insecure attachment relationship; Kagan's (1997), about how children become distressed after having a behaviourally inhibited temperament; Rubin and Mills' (1991), around how distress arises from parent-child interactions; Manassis and Bradley's (1994), about the relationship between temperament, attachment and distress in children; and of course, Chorpita and Barlow's (1998; Barlow, 2000, 2002). Basically, all of these models suggest that distress disorders develop from multiple interconnected causes. They support the view that an integration of temperamental, environmental and cognitive factors is required for a more complete understanding of the development of distress in children. The finding that a mediation effect existed between latent variables in the most complex model was further support for what is hypothesised to be developmentally expected in relation to distress development for children up to adolescence (Chorpita & Barlow, 1998; Barlow, 2000, 2002; see also, Cole & Turner, 1993; Weisz, Southam-Gerow & McCarty, 2001). That is, findings from the present study, using a sample of preadolescent children, support Barlow's contention that the combination of general biological and

environmental vulnerabilities is a precursor for a child's feelings of uncontrollability that then increases risk of anxious and depressive symptoms. As the definition of full mediation requires (Baron & Kenny, 1986), biological risk was found to lead to self-reported distress symptoms only through environmental risk and associated cognitive risk. (The one exception to this was seen in relationship to an unsupportive family and anxiety symptoms and is discussed in Section 14.5.1.). The model was able to demonstrate one way that the risk variables may be able to relate to each other and to self-reported anxiety and depression in preadolescent children. Thus, overall the results supported the research of Chorpita, Brown and Barlow (1998) who evaluated a similar but more limited model.

Before looking at the final model more extensively, there is a more detailed discussion of the results from, first, the replication and, second, the theoretical replication and extension model.

### **14.3. Replication**

As mentioned, Chorpita, Brown and Barlow (1998) evaluated an aetiological model of distress disorder explaining the relationship between parental control, distress disorders and control-related beliefs using a primarily clinical sample of preadolescent children. They found control-related beliefs protected the children from distress and accounted for 34% of the variance in negative affect, represented by a combination of self-reported anxiety and depression and parent-reported internalising behaviours. The present study, following the recommendations of those researchers, replicated the model using more specific measures. That included a more domain-specific perceived control measure and a parental control measure that included rejection and psychological control. The present study partially supported findings from the previous study, using a larger, nonclinical sample of similar aged children. It found that while feelings of control did protect children who perceived their

parents to be rejecting and controlling from having anxious feelings, they did not always protect children from depressed feelings.

There are several possible explanations for the differing results. One possibility is the difference in measures used to define family control and to define perceived control. Concerning family control, while the FES control subscale in the original study differentiates between an authoritative vs. democratic family style and contains items that ask the subject to rate whether rules or decisions are jointly made or made by those in authority (i.e. close to behavioural control; Barber, 2002), the scale used in the present study contains items concerning whether their parent is rejecting or psychological controlling. Barber (2002) has found that behavioural control has been related to positive adjustment while psychological control and rejection have been often associated with family dysfunction. In the present study, feelings of rejection, which contributed most to the definition of the parental control construct in the first model assessed (69% vs. 12% for psychological control) have been associated more directly with depression (Barber, 2002; Rapee, 1997). One study found the equivalent of rejection (low warmth and care) and not psychological control to be associated with depression in an adolescent sample (Reiss et al., 1995). Hence, with the present sample, feeling depressed could result either directly from feeling rejected and psychologically controlled or could be affected by how much control a child felt they had. On the other hand, anxious feelings have been observed to result more directly from perceptions of psychological control (Barber, 2002; Rapee, 1997) a less well-represented risk component of the parent control factor in this model.

The different definitions of control perceptions used in the two studies could also have contributed to the difference in results. The domain-specific measure of perceived control in the current study was more defined by the ability to control emotions and social situations rather than the general locus of control measure of the original study. Perhaps clarifying the type of control delineated a more specific relationship

between parental control and anxious and depressed feelings that was not possible with the general locus of control measure used in the Chorpita et al (1998) study. Sample differences were another possible reason for differences in findings. Nevertheless, the amount of variance in the criterion variables explained by both the Chorpita et al. (1998) model and the present model (see Figure 13.1) was relatively small suggesting childhood distress may be explained more fully by other variables.

#### **14.4. Replication and Extension**

When a child temperament factor represented by emotionality and shyness was added to represent the biological component of Barlow's theory, the model fit improved and the variance in the distress variables explained by the model increased substantially (see Figure 13.2). Perceived control again provided a partial mediation effect overall. This time, however, control perceptions were partially able to protect a child who felt their family to be rejecting and controlling from depression but not from anxiety. The strength of the direct effect on depression increased with the addition of child temperament, suggesting the possibility that being temperamentally emotional and shy could make it more likely that a child becomes depressed when rejected and controlled at home, though cognitive control perceptions could sometimes mediate these effects. While anxious feelings appeared also to be affected by the addition of a shy and emotional temperament, perceptions of control did not mediate here. In this model, Parental Control fully mediated the relation between child temperament and both anxiety and depression suggesting that sensitive, accepting parenting could protect a temperamentally vulnerable child from feelings of distress. Additionally, parent-reported child temperament, but not child perceptions affected parent-reports of their children's distressed behaviours. This relationship remained consistent throughout subsequent models and is discussed again in Section 14.5.3. With these two models as a background, the final models are discussed in relationship to other risk factors and the

effect on children's distress. Even though the addition of child temperament did increase the variance explained in distress symptoms, a fuller explanation of adversity and cognitive protection was sought.

#### **14.5. Biopsychosocial Risk Model**

A major objective of the current study was to specify and evaluate a complex model of childhood distress that reflected the inter-relations among a number of risk and protective variables. To complement this final complex model, a number of other, more parsimonious models were specified and evaluated in order to understand and more fully explain relationships within the model (Carver, 1989). Some of these preliminary models appeared to have better fit statistics associated with them than the final model as most fit indices reward parsimony. While they did not show the inter-relatedness among multiple factors which the final model did, they did provide convergent evidence about important factors in the model.

The final models included the child temperamental factor, perceived control factor and criterion variables evaluated in the previous two models. In addition, to represent more specifically predictors of distress, further defining factors were added and their theoretically predicted factor groupings were confirmed using factor analysis (see Table 13.2). To represent relational risk, a parent personal vulnerability risk factor most defined by parental fear and anxiety was added, since these variables have been associated with distress in children (Rubin & Mills, 1991; Manassis, & Bradley, 1994). To represent other family conditions related to distress, there were two other factors. One, labelled Family Control, was most defined by psychological control and enmeshment, while the other, labelled Lack of Support was most defined by lack of family cohesion and rejection. These factors have been related to distress in children (e.g., Siqueland, Kendall & Steinberg, 1996; Stark, Humphrey, Crook & Lewis, 1990).

To further define the cognitive constructs involved and to reflect the meaning of perceived control closest to Barlow's, aspects of the perceived control theory of Weisz (1990) and its extension were added. This comprised Weisz's perceived control construct which was extended to include emotional and attachment control (Thurber & Sigman, 1998, 1999) and the addition of a perceived competence factor (Harter, 1985b) also a component of Weisz's theory. The model which included all of these biological, relational, family and cognitive factors was considered as the final model as it reflected hypothesised associations among a number of related variables (see Figure 13.11).

Findings from the model support the idea that an emotionally-reactive, shy child, influenced by their parent's personal and relationship difficulties, would be less likely to have anxious and depressed feelings in the face of a controlling, non-supportive family environment if they felt they had control over primarily their emotions and social life and felt competent primarily in the social domain. Second, this complex model suggested that perceiving oneself to be competent, especially in the social domain, is more protective than a sense of control for an emotionally vulnerable child. In this complex model, perceived competence seemed to be the most clearly defined factor with 13% of Family Control, 14% of Lack of Family support, 22% of Perceived Control and 61% of Perceived Competence represented in the model. Together, these accounted for 51% of the variance in Anxiety Symptoms and 49% of the variance in depressive symptoms. Although 58% of the variance in parent-reported child emotional behaviour was predicted in the model, it was only predicted by parent-reported Child temperament which was influenced by parent-reported Parental Personal Vulnerabilities. This last issue is discussed further in Section 14.5.3.

The overall results are interesting in several ways. The mediation model did present an empirically and theoretically plausible way that general biological vulnerabilities relate to general psychological vulnerabilities, including the cognitive vulnerability of a perception of diminished control,

and competence, and the manifestation of self-reported anxiety and depressive symptoms. It was consistent with the position of developmental psychopathology that the risk for disorder development is multi-factorial and related in complex ways (e.g., Vasey & Dadds, 2001) and was consistent with the theoretical model elaborated by Barlow (2002). The relations between adversity, control-related perceptions and distress have also been supported by animal studies (Mineka, 1985; Sapolsky, Alberts & Altman, 1997) and child studies (Chorpita, Brown & Barlow, 1998; Stark, Schmidt & Joiner Jr., 1996).

In general, the findings are consistent with theoretical predictions that implicate a diminished sense of control over events as risk for anxiety and depression (Barlow, 2000, 2002; Chorpita, 2001; Chorpita & Barlow, 1998). They also were consistent with empirical findings that used mostly clinic-referred samples of children that showed the association between control-related beliefs and anxiety and depression (Chorpita, Brown & Barlow, 1998; Han, Weisz & Weiss, 2001; Muris, Schouten, Meesters & Gijssbers, 2003; Weisz, Southam-Gerow & McCarthy, 2001). Two studies (Weisz et al., 2001; Muris et al., 2003) which used, similar aged children, SEM and similar measures for perceived control and competence, but no adversity factors, related perceived control and perceived competence to depression and anxiety. While the Weisz et al. study assessed control-related beliefs in relation to depression in a clinical sample of children, the Muris et al. study assessed control-related beliefs in relation to both anxiety and depression in a community sample of children. As the individual subscale scores of either study were not reported and because the studies were not explicit, it was difficult to know what domain of control or competence most defined the factors. Nevertheless, Weisz et al.'s results were very similar to those found in the present study with the combination of perceived control and perceived competence explaining 43% of the variance in depression compared with 49% for the present study. When a secondary analysis was conducted with the present data using only the cognitive and distress constructs similar to the Weisz et al. and Muris et al. studies, the amount of variance

explained in depression was 40%, suggesting that the cognitive measures performed similarly in relation to depression despite the different indicators used (see Appendix D, note 3).

Interestingly, the Muris et al. study did not report results as similar. Less variance in both depression (36%) and anxiety (28%) was explained in that study. It might be reasonable to assume that the added variance in anxiety and depression explained in the present study may be attributed to the family and biological vulnerabilities which were not measured, but were likely influencing the solution in both the Weisz et al. (2001) and Muris et al. (2003) studies. More research will be necessary to determine if this is so.

Additional indirect evidence from treatment outcome studies supports the contention that control-related beliefs are important for managing anxiety in a temperamentally vulnerable child. Programmes which facilitate the understanding of anxiety and the learning of what can be done to manage it have led to treatment response and maintenance over a long period (e.g., Kendall & Southam-Gerow, 1996). This is consistent with the present findings that feeling in control of emotions and, in particular, competent to manage social situations, appears to protect a child from experiencing anxious and depressive symptoms.

As a result of specifying and evaluating other models, it was possible to observe the relative influence of the cognitive factors and family factors within the model. These models were also consistent with other research, particularly with Barlow's model. These relationships are now considered.

#### **14.5.1. Cognitive Mediators in the Model**

The cognitive factors of perceived control and competence were able to be observed in relation to the criterion variables of anxious and depressed symptoms and in relation to each other separately in different models. While each construct mediated the relationship between adversity and

distress (see Figures 13.3, 13.4), perceived competence (see Figure 13.4) consistently explained more variance in anxious and depressed feelings than did perceived control. That is, when competence alone was the cognitive mediator (see Figure 13.4), it explained more variance in anxiety (63%) and in depression (51%) than in the combined model (51% and 49%, respectively) or in the model with perceived control alone as the cognitive mediator (30% in anxiety, 32% in depression; Figure 13.3). Perceived competence also fully mediated the relationship between adversity and both anxiety and depression when both Family Factors (Figure 13.4) were involved, when only Family Control was present (Figure 13.10) and when only Lack of Family Support was present (Figure 13.8). When operating alone, Perceived Control too protected (i.e., fully mediated) emotionally vulnerable children from anxious and depressed feelings (for an exception, see Figure 13.9), but the paths were not as strong and less overall variance in the criterion variables was explained in those models (e.g., Figure 13.3 vs. Figure 13.4). In addition, direct paths from Child Temperament to Anxiety and depressive symptoms (Figure 13.7) existed when Perceived Control and Lack of Support were representing cognitive and family risk in the model, respectively. Further, looking at the control and competence constructs in the most complex model (Figure 13.11), more of the competence construct (61%) was explained by the adversity factors than the control construct (22%), although part of perceived competence was explained by perceived control. This pattern of findings suggested that a sense of control does not protect a temperamentally vulnerable child from anxious and depressed feelings to the extent that a sense of competence does (Figure 13.8). From the data provided in this study, it was clear that a sense of competence is more influential than a sense of control.

The difference in influence between the two cognitive constructs may possibly be related generally to how the cognitive constructs are conventionally defined and measured. Logic would suggest that it is more difficult to establish a feeling of competence. Competence perceptions are more externally verifiable and environmentally interactive while a

sense of perceived control indicates a possibly untried belief “if I really try” that is primarily person-centred. This would suggest that a person could have the belief without it reducing their anxious or depressive symptoms as they haven’t yet tried to make friends or be happy. Nevertheless, as findings from the complex model suggest, feeling in control may precede the feeling of competence and be implicit in its definition. Thus, both may be necessary to protect against feelings of distress in middle childhood. This is supported by the data when perceived competence was the only cognitive factor in the model (Figure 13.4). Less variance was explained by adversity in that model (40%) than in the model with both cognitive factors included (61%; Figure 13.11). Hence, a fuller understanding of both constructs may be instrumental in determining what is required to protect children from anxious and depressed feelings in middle childhood. However, given a choice, helping preadolescent youth develop a sense of competence appears to be more important.

#### **14.5.2. The Social Domain within Perceptions of Control and Competence**

In addition to the importance of perceived competence, the present study points strongly to the social domain as being salient in middle childhood. The perceived control construct was more defined by emotional and social control; the perceived competence construct, mostly by social competence. Moreover, it was socially anxious feelings which most explained the Anxious Symptoms factor. Rubin and Burgess (2001) suggest that feeling unconnected to peers (i.e., less socially competent) has a major impact on other aspects of a child’s life and can lead to distress. Ruble (1983) has suggested that the development of social comparison among peers in middle childhood is part of the process of evaluating one’s individual abilities. Hence, being in control of emotional feelings and perceiving oneself to be socially competent in comparison with others should be effective at protecting a child from anxious feelings and worry.

From the perspective of the distressed child, this growing awareness of evaluation by others may contribute to the orientation of internalising children toward the social domain (Han et al., 2001). For example, Han et al. (2001) found that children with internalising disorders saw themselves to be less competent and less in control of social situations, yet more in control of their overall behaviour than did children with externalising behaviours. A number of other studies have shown that anxious and depressed children have difficulties in the area of social and peer relationships (e.g., Chansky & Kendall, 1997; Kennedy, Spence & Hensley, 1989; Rubin & Mills, 1988; Rubin & Burgess, 2001) thus implicating the social domain as an important target for intervention.

#### **14.5.3. Family Environmental Factors in the Model**

The two family environmental factors used in the present study were an interesting combination of indicators which have previously been empirically related to distress (Siqueland et al., 1996; Stark et al., 1990) and were derived from factor analysis of the predictor variables. One factor labelled Family Control was primarily defined by indicators of psychological control and enmeshment and the other, labelled Lack of Family Support, was primarily defined by indicators of lack of cohesion and rejection. Other analyses have found preliminary evidence linking psychological control to anxious symptoms and lack of cohesion and rejection to depressive symptoms (Barber, 2002; Rapee, 1997). Based on current findings, evidence for parental psychological control being related to anxiety and rejecting parenting being related to depression was found in observing the first two models evaluated (Figure 13.1; Figure 13.2). In both models, more variance in depressive symptoms was explained by the parental control factor (whose predominant marker indicator was rejection). When the family constructs were extended, the assumption was that the Lack of Support factor, being defined more by rejection and lack of cohesion, would be more related to depression. Support for this possibility was mixed (e.g., supportive, see Figure 13.7;

not supportive, see Figures 13.8 and 13.9). Support for Family Control, which was more defined by psychological control, being related to anxious feelings was also mixed (e.g., see Figures 13.9, 13.10). These mixed results were similar to Rapee's (1997) conclusion based on a meta-analysis of multiple studies, indicating that the relations between psychological control and anxiety versus rejection and depressed feelings were apparent but modest.

Comparing the relative influence of the two family factors, there were some interesting differences. When both were represented in the models with perceived control or perceived competence alone or with both cognitive mediators, the variance in Family Control and Lack of Support was similar (Figures 13.3, 13.4, 13.11). However, when Lack of Support alone represented the family vulnerability, its influence reduced (Figures 13.7, 13.8, 13.5) compared to Family Control which did not reduce in influence. Family Control consistently explained more variance in both anxious and depressive symptoms. In addition, the amount of variance in anxiety and depression explained by the models with Family Control alone as the family vulnerability (Figures 13.6, 13.9, 13.10) or with both Family Control and Lack of Support (Figures 13.4, 13.7, 13.11) was more than was explained by other models. Additionally, in the model when Perceived Control was the mediator and both family factors were present (Figures 13.4), there was a direct path from Family Control to both Anxiety and depression, while no such direct path existed when the Lack of Family Support factor was included. This relationship suggested that when Family Control was the family risk involved, it influenced directly the manifestation of anxious and depressive symptoms while Lack of Family Support did not. That is, Family Control with indicators of psychological control, enmeshment, conflict and insecure attachment appeared to be the more prominent risk factor in relation to distress compared to Lack of Family Support with indicators of lack of cohesion, rejection, lack of family decision-making and lack of sociability.

Other research has similarly supported the notion that psychological control and its family environment equivalent, enmeshment are particularly related to childhood distress (Barber, 1996; Barber & Harmon, 2002; Stark, Schmidt & Joiner Jr., 1993). Others have found enmeshment and conflict to be related to childhood depression (Stark, Humphrey, Crook & Lewis, 1990).

Overall, the combination of Family Control and reduced Perceived Competence appeared to provide the most risk for distress symptoms while Lack of Support and diminished perceptions of control provided a lesser risk (Figure 13.10 cf. 13.7). Of course, more research, including longitudinal forms, is required to support these findings.

#### **14.5.4. Parent Personal and Child Temperament Vulnerabilities in the Model**

The addition of the Parent Vulnerability factor was reflective of other models which identified the importance of interacting parent-child temperaments as relating to child distress (Manassis & Bradley, 1994; Rubin & Mills, 1991). This factor consistently related to the child temperament factor exclusively with no significant paths specified between it and other factors. It also consistently explained about 30% of the variance in the Child Temperament factor and when removed, reduced the variance explained in anxious and depressive symptoms.

Consistently throughout the models tested, child temperament which was also affected by parent personal vulnerabilities appeared to relate directly to the criterion variable of parent-reported child emotional behaviours. In other words, how the child behaved emotionally (e.g., being clingy, seeming sad) was only related to the parent's report of their child's temperament, influenced in turn by the parent's report of their own temperamental tendencies. As parents completed all three measures, the likely explanation for this finding is at least in part shared method variance. However, perhaps parents are not such accurate reporters of

childhood distressed feelings. For example, Lonigan, Hooe, David and Kistner (1999) suggested that parent-reports of child distress tended to under-report the actual state because of an observer's difficulty in accurately identifying distress in children. Plomin and Caspi (1999) suggested that reporter personality affected reports on others, especially when that reporter was the natural parent (e.g., Saudino, McGuire, Hethington, Reiss & Plomin, 1995). With the great majority of parent reporters in the present sample being natural parents, this was perhaps an influence. Although some research has linked a child's early temperament to future behaviour (e.g., Caspi & Silva, 1995), other research has suggested that there are more inter-relationships involved (Dumas, Le Freniere & Serketich, 1995). Further research is needed to determine whether the direct relationships between parent vulnerability and biological vulnerability and between biological vulnerability and child emotional behaviour can be considered unique.

#### **14.5.5. Developmental Issues regarding the Biopsychosocial Model**

As mentioned, the current research (as with Chorpita & Barlow, 1998) found control-related beliefs to mediate as opposed to moderate the relationship between adversity and distress disorder symptoms in preadolescent children. This supports the theory and preliminary empirical findings that there may be developmental processes affecting outcomes as research and theory with adults support a moderational diathesis-stress model of distress disorders (e.g., Beck & Emery, 1985; Hammen, Adrian & Hiroto, 1988; Turner & Cole, 1994). In a mediation model, the effects of experiencing continued adversity activate a possible generalised psychological vulnerability that reflects a reduced sense of control. That in turn contributes to the development of a belief concerning perceptions of control and competence which then relate to self-reported anxiety and depressive symptoms. By contrast, in a moderation model, the effects of the experienced adversity directly relate to disorder development, but are increased or reduced by feelings of

control or competence (Baron & Kenny, 1986; Holmbeck, 1997). Turner and Cole (1994) from their research findings asserted that with children, adversity may activate belief patterns in the moment (e.g., a diminished sense of control), which could cause distress. However, if beliefs were changed (e.g., perceiving oneself to be in control) distress would not be the automatic result of adversity. This is in contrast with adolescent and adult findings which suggest that the pre-existing relationships between negative events and negative affect are only able to be diminished or amplified by cognitions (Barlow, Chorpita & Turovsky, 1996; Beck & Emery, 1985; Turner & Cole, 1994). Supportive evidence for a developmental progression from mediation to moderation in the formation of this psychological vulnerability to anxiety and depression has come from child attributional style literature which suggests that, in early childhood, anxiety and depression may develop from a generalised psychological vulnerability (a perception of uncontrollability) which directly determines the relationship between life experiences and distress, but only can buffer the relationship as the child reaches adolescence (Cole & Turner, 1993; Nolen-Hoeksema, Girgus & Seligman, 1992; Turner & Cole, 1994). Given the current study's cross-sectional design, it was not possible to assess this developmental sequence here. However, the resulting mediation model did fit with the findings of other child studies mentioned. If this developmental trajectory is found to exist, middle childhood would appear to be the time where intervention might have the most effect on control-related beliefs as these beliefs would still be malleable so would have direct ameliorative potential.

#### **14.6. Interpretation and Implications**

The biopsychosocial risk model of distress disorders developed in this study has supported Barlow's (2002) Triple Vulnerability Model of distress disorder presentation in middle childhood and clarified some of the relations within it. It has extended the theory and research in several ways. First, it has delineated the hitherto theoretical relationships among biological, environmental and cognitive risk for distress using a school

sample of children in middle childhood. Second, this research found that the addition of a parent-child relational component, a biological component and further family variables to the original empirical model (Chorpita, Brown & Barlow, 1998) did not change how control-related cognitions affected the report of distress symptoms in middle childhood. That is, the present study findings have supported the theory and research suggesting that control-related perceptions can perform a protective function against distress in middle childhood as opposed to a buffering role seen in adult research (Chorpita, Brown & Barlow, 1998; Cole & Turner, 1993; Hammen, Adrian & Hiroto, 1988; Nolen-Hoeksema, Girgus & Seligman, 1992). Third, the present study's findings using a school sample has extended findings from mostly clinical samples (Chorpita, Brown & Barlow, 1998; Stark, Schmidt & Joiner Jr., 1996). Consequently, findings here further the understanding that control-related cognitions can empower a child and make distress symptoms less likely. Fourth, this research has generated some possibilities of what risks may be more pervasive and what cognitive features may be particularly protective in relation to childhood distress. From this data, it appears that a family environment which is psychologically controlling, enmeshed and conflicted is more related to distress in children and perceived competence is more influential as a cognitive protector.

The present research also supports findings from other studies that having a fearful, anxious parent (Huzziff, 2004; Rapee, 1997; Rubin & Mills, 1991) may contribute to a child's distress. In the clinical setting, this information could be useful in identifying vulnerable families and in designing family-based interventions. Interventions based on helping the parent to manage their temperamentally vulnerable child with strategies other than psychological control may also increase their own sense of control and feelings of competence (Masten, 2001; Rubin & Mills, 1991). In fact, helping parents in conjunction with a cognitive-behavioural programme for children has demonstrated that parents' pre-treatment anxiety and depressive symptoms can be reduced to subclinical levels after treatment (Barrett, Dadds & Rapee, 1996; Cobham, Dadds &

Spence, 1998; Huzziff, 2004). Regarding clinic-based treatments for children, Weisz, Southam-Gerow and McCarty (2001) have stated that current programmes of treatment of child and adolescent distress disorders (Barrett, Dadds & Rapee, 1996; Jaycox, Reivich, Gillham & Seligman, 1994; Kaslow & Thompson, 1998; Lewinsohn, Clark, Hops & Andrews, 1990) generally tend to involve cognitive-behavioural methods. This includes skill-building (e.g., understanding and practicing social interactions with peers) and modifying cognitions (e.g., beliefs about not being good at making friends). These approaches too have been supported indirectly by the present results.

Because of the high cost of individual family interventions (Rutter, 1987), more school-based interventions and preventive interventions are required. Current findings could be useful in designing and providing evaluation targets for more cost-effective school-based intervention strategies. Bronfenbrenner (1996) advocated a school-wide culture change programme based on specific values (e.g., caring for others) which would promote social competence and provide a basis for protection from future adversity. Izard (2002) has asserted that interventions need to include learning to respond appropriately to emotion signals of others as part of social skills training to promote psychological adjustment, peer acceptance and adaptive social behaviours. Current results support the inclusion of skill development in areas of emotional and social control and social competence as targets for both intervention and programme evaluation. Teaching emotional control could facilitate appropriate expression of emotional feelings by helping individuals to understand their own feelings and how to modulate them, particularly in social-evaluative situations. The social control/competence component could help children practice strategies to understand, approach and relate appropriately to others. Combined with increased emotional regulation, it could also help them to manage criticisms from others (Izard, 2002). Application of these skills with peers may enhance the likelihood of being accepted by others, which in turn can begin to

change the cognitive schema to one of increased optimism about self and others.

The present mediation model findings that control-related beliefs appear to protect a vulnerable child from feelings of distress may be able to be used as a motivation for intervening early. As discussed, negative judgements about another's shyness and withdrawn behaviour are developed as early as seven, with children feeling, more acutely, the effects of such judgements by the age of ten (Rubin & Burgess, 2001). Additionally, as social phobia is the first adolescent anxiety disorder that seems to emerge and tends to be comorbid with a number of other disorders (Brown, et al., 2001), skills that promote social control and competence may be particularly salient in middle childhood. According to the current findings, it would seem important, then, to concentrate on specific skill-building to develop control over emotions (e.g., affective education and emotional regulation strategies) as well as interventions (e.g., cognitively-based and social skills training) designed to help youth feel in control of and, importantly, competent in social situations.

#### **14.7. Strengths and Limitations**

The results of the present study provide support for Chorpita and Barlow's model (Barlow, 2000, 2002; Chorpita, 2001) and have extended the model to include other theories that relate to the development of distress in children. The findings have also been helpful in suggesting which components assessed were most well represented in the model and were therefore more likely to be useful for identifying the most vulnerable children and suggesting possible targets for intervention and evaluation of interventions. The statistical method used in the present study has facilitated the building and evaluation of this model.

There were clear advantages to the use of structural modelling techniques for this study. Before these techniques became readily available, research into risk for distress disorders tended to be confined to

examinations of pairs of variables (Vasey & Dadds, 2001). As well as facilitating a study of multiple interconnections in relatively small samples, structural modelling, unlike multiple regression techniques, has allowed for an examination of both direct and indirect links among independent variable constructs defined by multiple measures and methods. This has been especially useful in this family system-oriented study of the links between parent and child personal characteristics and other key relationships in the family as they affect children's reports of distress.

Along with the advantages, however, there are limitations inherent in structural equation modelling techniques in general. Despite structural models being referred to as "causal models," they are never able to infer causation because of the correlational nature of their data and the cross-sectional nature of the design (Kazantzis, Ronan & Deane, 2001). Therefore, the data from the models cannot be used to confirm or make definitive causal statements. Accordingly, the current study could not consider the possible dynamic or developmental nature of these relationships over time. Equally, directionality of effect could not be assured with cross-sectional SEM analysis. For example, contrary to theory and research, it would be possible to construct a model where a child's distress symptoms were responsible for feelings of competence and control rather than follow from the control-related self-perceptions (Cole & Turner, 1993). Similarly, as with all mediation models and SEM models in general, it is invariably possible to conceive of alternative formulations that could fit the data set.

One way of assessing whether other variables have influence on the model is through sensitivity tests. This method incorporates a number of variables like age and gender one at a time into the model to see if these variables assert significance within it (Leamer, 1985). Unfortunately, this option was deemed not to be available within the present study, due to the model already being at its subject-to-parameter ratio limit (slightly less than 5:1; Tabachnick & Fidell, 2001). This ratio for the largest model

could have reduced the strength of the findings somewhat. However the simpler models, which did comply with sample size recommendations, tended to generate similar results. Further, as noted, the fit indices for all the models suggest that better measurement and better model specification are necessary for a more accurate demonstration of how distress develops and is manifest in children. These indices were not as high as with the clinical sample used by Chorpita et al. (1998) but were higher than two similar community-based studies (Muris, Schouten, Meesters & Gijbbers, 2003; Thurber & Sigman, 1998) suggesting the possible influence of a general population sample.

Further caveats should be noted when interpreting the findings of this study.

One limitation involves sample selection. Although the present research findings supported many of the overseas findings, generalisability to a more representative New Zealand population and broader international population of children is tentative as the study involved a relatively homogeneous, generally European, New Zealand population of school children from a semi-rural area. Though the economic backgrounds were relatively representative of New Zealand in general, with all but the very disadvantaged category of children represented, a city population was not represented. Some ethnic groups (e.g., Māori and Pacific Island groups) were also under-represented in the sample. As this appears to be the first school sample using SEM to study all of these constructs together, inter-group comparison was not possible. More research is required to determine whether this model would be suitable for use with New Zealand's indigenous people (Māori) and other ethnic minorities within New Zealand as well as with a representative New Zealand sample.

Also contributing to sample bias was the voluntary nature of the participation. This would mean that more resilient children and their parents might be more likely to participate. In fact, one mother reported anecdotally that she didn't allow her son to participate in the study

because of his tendency to get anxious 'with these sorts of things'. It is impossible to determine how many other parents made a similar protective decision.

Another area of concern was the nature of some of the measures used. Although the criterion measures of depressive and anxiety symptoms were standardised measures extensively used in clinical assessment, they have been found to be more measures of general negative affect than specific measures of anxiety or depression (e.g., King, Ollendick & Gullone, 1991; Norvell, Brophy & Finch, 1985; Stark & Laurent, 2001; Wolfe et al., 1987). Nevertheless, with the present sample, the measures seemed to act differently with regard to the cognitive mediators when their similarity was acknowledged with the intercorrelations of error terms. Perhaps the use of the CDI short form rather than the longer form allowed for more differentiation between it and the RCMAS. Also, with any of the measures, but especially these ones, immediate circumstantial factors (e.g., a disagreement with a friend or parent on the day of test administration) might have influenced responses.

A measure which influenced the solution less strongly than expected was the child and parent measure of attachment security as this has been found to be very important in shaping a child's cognitive template (Bowlby, 1983; Muris, Mayer & Meesters, 2000; Warren, Huston, Egeland & Sroufe, 1997). A possible reason for this was the paragraph scenario format which could have been too sophisticated for the children and perhaps too complicated for some of the parents. Additionally, the three parent-reported factors (child temperament, child emotional behaviour and parent vulnerabilities) appeared to relate too closely in the model suggesting the possibility of shared method variance.

Another limitation was the inability to include a greater number of important constructs in the models. As is always the case, there were other predictors like abuse, religiosity, peer and sibling relationships and demographic factors like birth history, possible experiences of loss or

immediate stress which could have affected distress. More indicators, however, would necessitate a larger sample.

The next limitation involves the self-report method by which most of the data were derived. Although data were collected from both parents and children, they still represented largely self-report data. Therefore, the relationships found in the study did not necessarily pertain to objective family conditions, observed control or competence or noticeable anxious or depressive symptoms. The evidence is mixed regarding the relationship between subjective and objective reality as some findings suggest that distressed children's control and competence perceptions do relate to actual abilities (especially in the social domain; e.g., Altmann & Gotlib, 1988), while other evidence suggests internalising children may underestimate at least some of their actual abilities (e.g., Cole, Martin, Peeke, Seroczynski & Hoffman, 1998). Self-report methods are generally considered more credible than parent report especially for collecting data on internalising problems (e.g., Achenbach, McConaughy, & Howell, 1987; Ollendick & Hersen, 1998) and have been seen to relate more closely with clinician judgements particularly with depression (Rubio-Stipec et al., 1994). A clinical rating would possibly have added to the results. However, since the present study focused on subjective experience and used a school sample, clinical assessments were considered less important to obtain. Equally, the current study's interest and focus on perceptions of family function, control and competence beliefs made objective validation less relevant.

Another limitation involves the fact that Barlow's (2002) total model was not examined in this study. Further to the general biological and psychological vulnerabilities, Barlow included a specific psychological vulnerability component in his model. This he suggested was the component which, in the presence of general biological and psychological vulnerability, was most likely to lead to specific clinical presentation (e.g., a shy child, who experienced diminished control in a socially isolated family may become socially anxious when faced with expectations to

socially interact with peers in high school). The present study was not designed to incorporate this final vulnerability into it. Again, however, with a nonclinical sample of children and no clinical ratings, it would be more difficult to assess disorder manifestation, *per se*. Consequently, the current study would be more applicable to the precursors to distress disorder development.

Despite its shortcomings, the present study was able to show a relationship between general biological and psychological risk and include some areas of the relationship between the parent and child temperament mentioned but not specifically emphasised by Barlow (2002) in his model. This model was able to extend research in the area of anxiety aetiology that has been hitherto confined generally to the downward extension of adult research and less complex relationships among pairs of variables (Vasey & Dadds, 2001). It was able to support a multicausal view of the aetiological theories of anxiety (i.e. Barlow, 2002; Chorpita & Barlow, 1998; Craske, 1999; Manassis & Bradley, 1994; Rubin & Burgess, 2001; Vasey & Dadds, 2001). In addition, this model supported the view that an integration of temperamental, relational, family and cognitive variables is helpful for a greater understanding of the development of distress in children.

#### **14.8. Recommendations for Future Research**

Future research is required to support the biopsychosocial risk model presented. This needs to include larger and more varied samples, more robust measures (e.g., a multi-item attachment measure and perhaps a more age-appropriate measure of child temperament) and a longitudinal design which when combined may be able to account for more of the variance in anxiety and depressive symptoms.

Model evaluation using different and larger populations would allow for additional assessment of age, gender and other relevant effects. Clearer measures in the area of temperament and attachment would advance the

field considerably. A secure attachment relationship especially has been seen to influence distress symptoms (Muris et al., 2000; Warren al., 1997) and yet the present model was not able to show the apparent importance of this relationship. Also, further defining control beliefs would more fully delineate how these important constructs relate to distress. For instance, using a recently developed measure assessing perceived control over external threat and internal emotions or body reactions, Weems, Silverman Rapee and Pina (2003) found that perceptions of control over internal reactions and external threat were more predictive of anxiety symptoms than were general control beliefs.

Longitudinal research could determine the direction of effects as the present structural model used with a cross-sectional design was not able to make that determination. In particular, it could add weight to the findings of Muris et al. (2003) which suggest that control-related beliefs, especially competence, are prospectively as well as concurrently associated with distress disorders. Further, although cognitive mediation was found here with a general population sample, only longitudinal research would clarify the developmental processes involved. A longitudinal design, especially spanning across childhood and adolescence, would be able to establish if and when control cognitions changed from being protective of distress development to only buffering the effects of distress. These improvements to the design would not only advance the theoretical understanding of distress disorder development in children but also provide practical targets for identification, intervention and prevention strategies for childhood distress disorders.

Future model replication and treatment-based studies are required to support emotional and social control and social competence constructs as school intervention targets. They are also required to determine whether clinic-based treatment for children would be effective if the focus were on specific control-related strategies and whether a parent-focussed programme around replacing psychologically controlling and rejecting

parenting with other more child-focused parenting strategies would be successful in reducing risk for childhood distress.

### **14.9. Conclusions**

Anxiety disorders are the most prevalent type of psychological disorder for children and adolescents (Albano, Chorpita & Barlow, 1996; Fergusson, Horwood & Lynskey, 1993; Verhulst, van der Ende, Ferdinand & Kasius, 1997) and mood disorders are closely linked (Fergusson, Horwood & Lynskey, 1993; Kendall, 1994). Further, if left untreated, prognosis is poor (Dadds, Barrett & Cobham, 1997). The current study sought to define more fully some of the biological, relational and family constructs that contributed to the vulnerability for anxious and depressed feelings in a New Zealand school population of preadolescent children. It also sought to define the cognitive constructs that would be likely to protect children from further problems with distress.

A number of significant findings and implications have arisen from this dissertation. First, the results, using a school sample of preadolescent children, partially replicated previous findings using a mostly clinical sample of American preadolescent children (Chorpita, Brown & Barlow, 1998). Results of a more complex model showed that perceptions of control and competence protected these New Zealand preadolescent children from reporting distress. Current results have extended previous research by empirically evaluating the relationships between biological and psychological vulnerability and control-related cognitions in the Barlow model. Results have further extended this model with the addition of other relevant theories and produced a theoretically and empirically verifiable biopsychosocial risk model of distress development. Current findings provide empirical support for the theoretical links between parent personal vulnerabilities, child temperamental vulnerabilities, family and parenting risk factors and cognitive protectors in predicting anxious and depressive symptoms in children (Chorpita & Barlow, 1998; Manassis & Bradley, 1994; Rubin & Mills, 1991). Putting it

together, it seems that these variables operate as part of a dynamic network.

Second, the present study demonstrates the importance of a sense of control and competence in anxiety and depression development. These more fully defined cognitive constructs of perceived control and competence were able to demonstrate more specifically how perceptions of control and especially competence were able to protect an emotionally vulnerable child from reporting anxious and depressed feelings in the face of certain family environment conditions. Further, this study transferred the focus from the specific risk factors which are less amenable to change (e.g., family conditions) to qualities which can be encouraged, learned and incorporated into a general strategy for getting along with others. If offered as a routine part of a school curriculum, the anxiety-prone child can gain benefit without having to feel specifically targeted.

Third, the results show preliminary support for the salience of family control over lack of support as a stronger predictor of distress feelings. This study adds general family systems conditions to the theory and research of Barber (2002) and colleagues which relate psychologically controlling parenting with distress (see also Morris et al., 2002; Pettit, Laird, Dodge, Bates & Criss, 2001). Further, data suggests that family control (e.g., psychological control) is a more difficult family condition for a child to overcome than lack of support (e.g., lack of cohesion and rejection). The question has also been raised regarding the possibility that lack of support may have a greater influence on feelings of depression because the model including only lack of support and control perceptions accounted for more variance in the depressive symptoms than the anxiety ones. As this same relationship did not occur with competence perceptions and other findings were mixed, more research is required to understand this relationship.

Fourth, the cognitive mediator which accounted for the most variance in anxious and depressed symptoms was perceived competence. This

finding supports the work of Harter, Whitesell and Kowalski (1992) who found perceptions of competence to be predictive of an adolescent's adjustment to high school and Muris et al.'s (2003) more recent finding that perceived competence most explained the longitudinal development of both anxious and depressive symptoms in a school sample of preadolescents. Further, perceptions of competence appear to be more salient in predicting feelings of distress than objectively measured competence (Miserandino, 1996; Skinner, Zimmer-Gembeck & Connell, 1998), a finding which has direct implications for clinical practice.

Related to this last point, identification and intervention implications were generated from the findings of the present study. From this study, it appeared that those children most in need of identification for intervention would be emotionally vulnerable children who came from psychologically controlling, enmeshed family systems. As the variables which contributed most to the definition of perceived control were, first, emotional control (feeling able to get control of sad or anxious feelings if one tries) and, second, social control (feeling that one can have friends if they try), they may be particularly fruitful targets. Similarly, the variable defining perceived competence was the perception of social competence (perception of having friends and being liked compared with others). This suggested that feeling socially rather than academically competent would better help to protect a child from feelings of distress.

Fifth, the present findings provide possibilities for future research. First, it will be necessary to define further the mechanisms underlying biological and environmental predictors of anxiety and depression as well as perceptions of control and competence. More precise measures of temperament, attachment, anxiety and depression would also be useful. This would allow for earlier and more accurate identification of children who had the potential to be distressed. A clearer definition of what constituted perceptions of control and competence would also make intervention strategies more effective. Additionally, a stronger research design (more participants, longitudinal design) would help to delineate

when a child's control and competence beliefs became fixed in relation to anxiety and depression and help to understand better the developmental processes involved. The addition of Barlow's Third Specific Psychological Vulnerability into a longitudinal design would add further understanding of the process. These additions would assist in identifying optimal times for interventions.

In conclusion, this study demonstrates the utility of integrating biological, environmental and cognitive risk and protection in order to better understand distress disorder development in children. The present study contributed by developing a model of distress disorder aetiology which could apply to a school population of children. From this, researchers can begin to build related models which will further advance the field. The findings highlight the importance of formulating aetiological models using multiple constructs and including differing aspects of early experience. Such a focus and model design demonstrates the intricacies involved in determining anxiety and depression aetiology and is a reminder of the complexity of what is clearly an interactive and dynamic process. More importantly, if further research supported the relationships found in the current study, it would not only advance the understanding of anxiety and depressive disorder development but also substantially contribute to practical identification, intervention and prevention strategies for those children at greatest risk for the development of distress disorders.

## REFERENCES

- AACAP. (1997). Practice parameters for the assessment and treatment of children and adolescents with anxiety disorders. *Journal of the American Academy of Child and Adolescent Psychiatry*, 36, 69-84.
- Abramson, L. Y., Metalsky, G. I., & Alloy, L. B. (1989). Hopelessness depression: A theory-based subtype of depression. *Psychological Review*, 96, 358-372.
- Abramson, L. Y., Seligman, M. E. P., & Teasdale, J. D. (1978). Learned helplessness in humans: Critique and reformulation. *Journal of Abnormal Psychology*, 87, 49-74.
- Achenbach, T. M. (1990). What is "developmental" about developmental psychopathology? In J. Rolf & A. Masten & D. Cicchetti & K. H. Neuchterlein & S. Weintraub (Eds.), *Risk and protective factors in the development of psychopathology* (pp. 29-48). New York: Cambridge University Press.
- Achenbach, T. M., McConaughy, S. H., & Howell, C. T. (1987). Child/adolescent behavioral and emotional problems: Implications of cross-informant correlations for situational specificity. *Psychological Bulletin*, 101, 213-232.
- Ackerman, N. W. (1958). *The psychodynamics of family life: Diagnosis and treatment of family relationships*. New York: Basic Books.
- Acock, A. C., & Demo, D. H. (1999). Dimensions of family conflict and their influence on child and adolescent adjustment. *Sociological Inquiry*, 69, 641-658.
- Adamec, R. E., & Stirt-Adamec, C. (1986). Limbic hyperfunction, limbic epilepsy and interictal behaviour. In B. K. Doane & K. E. Livingston (Eds.), *The limbic system*. New York: Raven.
- Ainsworth, M. D., S, Blehar, M. C., Waters, E., & Wall, E. (1978). *Patterns of attachment: A psychological study of the strange situation*. Hillsdale, NJ: Erlbaum.
- Ainsworth, M. D. S. (1979). Infant-mother attachment. *American Psychologist*, 34, 932-937.
- Akaike, H. (1987). Factor analysis and the AIC. *Psychometrika*, 52, 317-332.
- Albano, A. M., Chorpita, B. F., & Barlow, D. H. (1996). Childhood anxiety disorders. In E. J. Mash & R. A. Narkley (Eds.), *Child psychopathology* (pp. 196-241). New York: Guilford Press.
- Alfano, C. A., Biedel, D. C., & Turner, S. M. (2002). Cognition in childhood anxiety: Conceptual, methodological and developmental issues. *Clinical Psychology Review*, 22(8), 1209-1238.
- Allen, J. P., Hauser, S. T., Bell, K. L., & O'Connor, T. G. (1994). Longitudinal assessment of autonomy and relatedness in adolescent-family interactions as predictors of adolescent ego development and self-esteem. *Child Development*, 65, 179-194.
- Allen, J. P., & Land, D. (1999). Attachment in adolescence. In J. Cassidy & P. R. Shaver (Eds.), *Handbook of attachment: Theory, research and clinical applications* (pp. 319-335). New York: Guilford.
- Alloy, L. B., Kelly, K. A., Mineka, S., & Clements, C. M. (1990). Comorbidity of anxiety and depressive disorders: A helplessness-hopelessness perspective. In M. J.D. Maser & C.

- R. Cloninger (Eds.), *Comorbidity of mood and anxiety disorders* (pp. 499-543). Washington, D.C: American Psychiatric Press.
- Allport, G.W. (1937). *Personality: A psychological interpretation*. New York: Holt.
- Altmann, E. O., & Gotlib, I. H. (1988). The social behavior of depressed children: An observational study. *Journal of Abnormal Child Psychology*, 16, 29-44.
- Alwin, D. E. (1990). Cohort replacement and changes in parental socialization values. *Journal of Marriage and the Family*, 52, 347-360.
- Ambrose, B., & Rholes, W. S. (1993). Automatic cognitions and the symptoms of depression and anxiety in children and adolescents: An examination of the content-specificity hypothesis. *Cognitive Therapy and Research*, 17, 153-171.
- Anderson, J. C. (1994). Epidemiological issues. In R. H. Ollendick & N. J. King & W. Yule (Eds.), *International handbook of phobic and anxiety disorders in children and adolescents* (pp. 43-66). New York: Plenum Press.
- Anderson, J. C., & Gerbing, D. W. (1988). Structural equation modelling in practice: A review and recommended two-step approach. *Psychological Bulletin*, 103, 411-423.
- Anderson, J. C., Williams, S. M., McGee, R., & Silva, P. A. (1987). DSM-III disorders in preadolescent children: Prevalence in a large sample from the general population. *Archives of General Psychiatry*, 44, 69-76.
- Andrews, G., Stewart, G., Allen, R., & Henderson, A. S. (1990). The genetics of six neurotic disorders: A twin study. *Journal of Affective Disorders*, 19, 23-29.
- Angst, J., Vollrath, M., Merikangas, K. R., & Ernst, C. (1990). Comorbidity of anxiety and depression in the Zurich Cohort Study of Young Adults. In J. D. Maser & C. R. Cloninger (Eds.), *Comorbidity of mood and anxiety disorders* (pp. 123-137). Washington, D.C.: American Psychiatric Press.
- Anisfeld, E., Casper, V., Nozyce, M., & Cunningham, N. (1990). Does infant carrying promote attachment?: An experimental study of the effects of increased physical contact on the development of attachment. *Child Development*, 61, 1617-1627.
- Anthony, J. L., Lonigan, C. J., Hooe, E. S., & Phillips, B. M. (2002). An affect-based, hierarchical model of temperament and its relations with internalising symptomatology. *Journal of Clinical Child Psychology*, 31(4), 480-490.
- Arbel, N., & Stravinsky, A. (1991). A retrospective study of separation in the development of adult avoidant personality disorder. *Acta Psychiatrica Scandinavica*, 83, 174-178.
- Arbuckle, J., & Wothke, W. (1999). *Amos user's guide (Version 4.0)*. Chicago: Smallwaters.
- Armsden, G., & Greenberg, M. T. (1987). The inventory of parent and peer attachment: Individual differences and their relationship to psychological well-being in adolescence. *Journal of Youth and Adolescence*, 16, 427-454.
- Armsden, G. C., McCauley, E., Greenberg, M. T., Burke, P. M., & Mitchell, J. R. (1990). Parent and peer attachment in early adolescent depression. *Journal of Abnormal Child Psychology*, 18(6), 683-697.
- Asarnow, J. R. (1992). Suicidal ideation and attempts during middle childhood: Associations with perceived family stress and depression among child psychiatric inpatients. *Journal of Clinical Child Psychology*, 21(1), 35-40.

- Asarnow, J. R., Carlson, G. A., & Guthrie, D. (1987). Coping strategies, self-perceptions, hopelessness and perceived family environments in depressed and suicidal children. *Journal of Clinical Child Psychology, 18*, 129-136.
- Association, A. P. (1968). *Diagnostic and statistical manual for mental disorders* (2nd ed.). Washington, DC: Author.
- Association, A. P. (1980). *Diagnostic and statistical manual for mental disorders* (3rd ed.). Washington, DC: Author.
- Association, A. P. (1987). *Diagnostic and statistical manual for mental disorders* (3rd.ed.rev. ed.). Washington, DC: Author.
- Association, A. P. (1994). *Diagnostic and statistical manual for mental disorders* (4th ed.). Washington, DC: Author.
- Association., A. P. (1952). *Diagnostic and statistical manual for mental disorders* (1st ed.). Washington, DC: Author.
- Avenevoli, S., Stolar, M., Li, J., Dierker L. & Merikangas, K.R. (2001). Comorbidity of depression in children and adolescents: Models and evidence from a prospective high-risk family study. *Biological Psychiatry, 49*, 1071-1081.
- Averill, J. R. (1973). Personal control over aversive stimuli and its relationship to stress. *Psychological Bulletin, 80*, 286-303.
- Balbernie, R. (2002). An infant in context: Multiple risks, and a relationship. *Infant Mental Health Journal, 23*(3), 329-341.
- Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review, 84*, 191-215.
- Bandura, A. (1986). *Social foundations of thought and action*. Englewood Cliffs, NJ: Prentice-Hall.
- Bandura, A., Adams, N. E., & Beyer, J. (1977). Cognitive processes mediating behavioral change. *Journal of Personality and Social Psychology, 35*, 125-139.
- Barber, B. K. (1992). Family, personality and adolescent problem behaviours. *Journal of Marriage and the Family, 54*, 69-79.
- Barber, B. K. (1996). Parental psychological control: Revisiting a neglected construct. *Child Development, 67*, 3296-3319.
- Barber, B. K. (1997). Adolescent socialization in context-The role of connection, regulation and autonomy in the family. *Journal of Adolescent Research, 12*, 5-11.
- Barber, B. K. (2002). *Intrusive parenting: How psychological control affects children and adolescents*. Washington, DC: American Psychological Association.
- Barber, B. K., Bean, R. L., & Erikson, L. D. (2002). Expanding the study and understanding of psychological control. In B. K. Barber (Ed.), *Intrusive parenting: How psychological control affects children and adolescents* (pp. 263-289). Washington, DC: American Psychological Association.
- Barber, B. K., & Buehler, C. (1996). Family cohesion and enmeshment: Different constructs, different effects. *Journal of Marriage and the Family, 58*, 433-441.
- Barber, B. K., & Harmon, E. L. (2002). Violating the Self: Parental psychological control of children and adolescents. In B. K. Barber (Ed.), *Intrusive parenting: How psychological*

- control affects children and adolescents* (pp. 15-52). Washington, DC: American Psychological Association.
- Barber, B. K., Olsen, J. A., & Shagle, S. (1994). Associations between parental psychological control and behavioural control and youth internalised and externalised behaviours. *Child Development, 65*, 1120-1136.
- Barlow, D. H. (1988). *Anxiety and its Disorders: The nature and treatment of anxiety and panic*. New York: Guilford Press.
- Barlow, D. H. (1991). Disorders of emotion. *Psychological Inquiry, 2*, 58-71.
- Barlow, D. H. (2000). Unravelling the mysteries of anxiety and its disorders from the perspective of emotion theory. *American Psychologist, 55*, 1245-1247.
- Barlow, D. H. (2002). *Anxiety and its disorders: The nature and treatment of anxiety and panic* (2nd ed.). New York: Guilford Press.
- Barlow, D. H., Chorpita, B. F., & Turovsky, J. (1996). Fear, panic anxiety and the disorders of emotion. In D. A. Hope (Ed.), *Nebraska symposium on motivation: Perspectives on anxiety, panic and fear* (Vol. 43, pp. 251-328). Hillsdale, N.J.: Erlbaum.
- Barnes, H. L., & Olsen, D. H. (1985). Parent-adolescent communication and the circumplex model. *Child Development, 56*, 438-447.
- Baron, P., & MacGillivray, R. G. (1989). Depressive symptoms in adolescence as a function of perceived parental behaviour. *Journal of Adolescent Research, 4*, 50-62.
- Baron, R., & Kenny, D. (1986). The moderator-mediator distinction in social psychology research: Conceptual, strategic and statistical considerations. *Journal of Personality and Social Psychology, 51*, 1173-1182.
- Barrett, P. M. (2000). Treatment of childhood anxiety: Developmental aspects, *Clinical Psychology Review, 20*, 279-494.
- Barrett, P. M., Dadds, M. R., & Rapee, R. M. (1996). Family treatment of childhood anxiety: A controlled study. *Journal of Consulting and Clinical Psychology, 64*, 333-342.
- Barrett, P. M., Rapee, R. M., Dadds, M. R., & Ryan, S. M. (1996). Family enhancement of cognitive style in anxious and aggressive children: Threat bias and the FEAR effect. *Journal of Abnormal Child Psychology, 24*, 187-203.
- Bartholomew, K., & Horowitz, L. M. (1991). Attachment styles among young adults: A test of a four-category model. *Journal of Personality and Social Psychology, 61*, 226-244.
- Bartholomew, K., & Shaver, P. R. (1998). Methods of assessing adult attachment: Do they converge? In J. A. Simpson & W. S. Rholes (Eds.), *Attachment theory and close relationships* (pp. 25-43). New York: Guilford Press.
- Bateson, G., Jackson, D. D., Haley, J., & Weakland, J. (1956). Towards a theory of schizophrenia. *Behavioural Science, 1*, 251-264.
- Baumrind, D. (1991). The influence of parenting style on adolescent competence and substance use. *Journal of Early Adolescence, 11*, 56-95.
- Baxter, L. R., Schwartz, J. M., Bergman, K. S., Szuba, M. P., Guze, B. H., Mazziota, J. C., Alazraki, A., Selin, C. E., Ferng, H. K., & Munford, P. e. a. (1992). Caudate glucose metabolic rate changes with both drug and behaviour therapy for obsessive-compulsive disorder. *Archives of General Psychiatry, 49*, 681-699.

- Beavers, W. R., Hampson, R. B., & Hulgus, Y. F. (1985). Commentary: The Beavers systems approach to family assessment. *Family Process*, 24, 398-405.
- Beck, A. T. (1993). Cognitive therapy: Past, present and future. *Journal of Consulting and Clinical Psychology*, 61(2), 194-198.
- Beck, A. T. (1993). Cognitive therapy: Past, present and future. *Journal of Consulting and Clinical Psychology*, 61(2), 194-198.
- Beck, A. T., Brown, G. W., Steer, R. A., Eidelson, J. T., & Riskind, J. H. (1987). Differentiating anxiety and depression: A test of the cognitive content-specificity hypothesis. *Journal of Abnormal Psychology*, 96, 179-183.
- Beck, A. T., & Clark, D. A. (1997). An information processing model of anxiety: Automatic and strategic processes. *Behaviour Research and Therapy*, 35, 40-58.
- Beck, A. T., & Clark, D. A. (1997). An information processing model of anxiety: Automatic and strategic processes. *Behaviour Research and Therapy*, 35, 40-58.
- Beck, A. T., & Emery, G. (1985). *Anxiety disorders and phobias: A cognitive perspective*. New York: Basic Books.
- Beidel, D. C., Turner, S. M., & Fink, C. M. (1996). Assessment of childhood social phobia: Construct, convergent and discriminative validity of the social phobia and anxiety inventory for children (SPAI-C). *Psychological Assessment*, 8, 235-240.
- Bell-Dolan, D. J. (1995). Social cue interpretation of anxious children. *Journal of Clinical Child Psychology*, 24, 1-10.
- Belsky, J., Campbell, S. B., Cohn, J. F., & Moore, G. (1996). Instability of infant-parent attachment security. *Developmental Psychology*, 32, 921-924.
- Bennet, A., & Stirling, J. (1998). Vulnerability factors in the anxiety disorders. *British Journal of Medical Psychology*, 71, 311-321.
- Benoit, D., & Parker, K. C. H. (1994). Stability and transmission of attachment across three generations. *Child Development*, 65, 1444-1456.
- Bentler, P. M. (1990). Comparative fit indices in structural models. *Psychological Bulletin*, 107, 238-246.
- Bernstein, G. A., & Borchardt, M. D. (1991). Anxiety disorders of childhood and adolescence: A critical review. *Journal of the American Academy of Child and Adolescent Psychiatry*, 30, 519-532.
- Biederman, J., Rosenbaum, J. F., Hirschfeld, D. R., Faraone, S. V., Bolduc, E. A., Gersten, M., Meminger, S. R., Kagan, J., Snidman, N., & Reznick, J. S. (1990). Psychiatric correlates of behavioral inhibition in young children of parents with and without psychiatric disorders. *Archives of General Psychiatry*, 47, 21-26.
- Blair, C. (2002). School Readiness: Integrating cognition and emotion in a neurobiological conceptualisation of children's functioning at school entry. *American Psychologist*, 57(2), 111-127.
- Block, J. H., & Block, J. (1980). The role of ego-control and ego-resiliency in the organisation of behaviour, *Minnesota symposium on child psychology* (Vol. 13, pp. 39-101). Hillsdale, NJ: Lawrence Erlbaum Associates Inc.
- Bloom, B. L. (1985). A factor analysis of self-report measures of family functioning. *Family Process*, 24, 225-239.

- Bloom, B. L. (1996). The Colorado Family Assessment: A computer-based procedure for multilevel family evaluation. In C. A. Heflinger & C. T. Nixon (Eds.), *Families and the mental health system for children and adolescents: Policy, services and research*. Beverly Hills CA: Sage Publications.
- Bloom, B. L., & McNaar, S. (1994). Self-report measures of family functioning: Extensions of a factorial analysis. *Family Process*, 33, 203-216.
- Boer, F., & Westenberg, P. M. (1994). The factor structure of the Buss and Plomin EAS temperament survey (parental ratings) in a Dutch sample of elementary school children. *Journal of Personality Assessment*, 62(3), 537-551.
- Bogel, S. M., & Zigterman, D. (2000). Dysfunctional cognitions in children with social phobia, separation anxiety disorder and generalised anxiety disorder. *Journal of Abnormal Child Psychology*, 28(2), 205-211.
- Bollen, K. A. (2002). Latent variables in psychology and the social sciences. *Annual Review of Psychology*, 53, 605-634.
- Booth, C. L., Rubin, K. H., & Rose-Krasnor, L. (1998). Perceptions of emotional support from mother and friend in middle childhood: Links with social-emotional adaptation and preschool attachment security. *Child Development*, 69(2), 427-442.
- Boszormenyi-Nagy, I., Grunebaum, J., & Ulrick, D. (1991). Contextual therapy. In A. S. Gurman & D. P. Kniskern (Eds.), *Handbook in family therapy* (Vol. Vol. II, pp. 200-238). New York: Brunner/Mazel.
- Bourne, E. J. (1990). *The anxiety and phobia workbook*. Oakland, CA: New Harbinger Publications.
- Bouton, M. E., Mineka, S., & Barlow, D. H. (2001). A modern learning theory perspective on the aetiology of panic disorder. *Psychological Review*, 108, 4-32.
- Bowlby, J. (1969). *Attachment and loss: Attachment*. (Vol. 1). New York: Basic Books.
- Bowlby, J. (1973). *Attachment and loss: Separation* (Vol. 2). New York: Basic Books.
- Bowlby, J. (1980). *Attachment and loss: Loss, sadness and depression* (Vol. 3). New York: Basic Books.
- Bowlby, J. (1988). *A secure base: Parent-child attachments and healthy human development*. New York: Basic Books.
- Boyd, C. P., & Gullone, E. (1997). An investigation of negative affectivity in Australian adolescents. *Journal of Clinical Child Psychology*, 26, 190-197.
- Bradley, B. P., Mogg, K., & Williams, R. (1995). Implicit and explicit memory for emotional-congruent information in clinical depression. *Behaviour Research and Therapy*, 33, 755-770.
- Bradley, R. H., & Caldwell, B. M. (1979). Home environment and locus of control. *Journal of Clinical Child Psychology*, 8, 107-111.
- Bradley, S. (1990). Psychopathology and affect regulation: Bridging the mind-body gap. *Canadian Journal of Psychiatry*, 35, 540-547.
- Brady, E. U., & Kendall, P. C. (1992). Comorbidity of anxiety and depression in children and adolescents. *Psychological Bulletin*, 111, 244-255.

- Brennan, K. A., Clark, C. L., & Shaver, P. R. (1998). Self-report measurement of adult attachment. In J. A. Simpson & W. S. Rholes (Eds.), *Attachment theory and close relationships* (pp. 46-76). New York: Guilford Press.
- Bretherton, I. (1985). Attachment theory: Retrospect and prospect. In I. Bretherton & R. Waters (Eds.), *Growing points of attachment theory and research. Monographs of the Society for Research in Child Development*, 50 (1-2, Serial No. 209), 66-104.
- Bretherton, I. (1992). The origins of attachment theory: John Bowlby and Mary Ainsworth. *Developmental Psychology*, 28, 759-775.
- Bretherton, I. (1995). A communication perspective on attachment relationship and internal working models, In E. Waters, B. Vaughn, G. Posada & K. Kondo-Ikemura (Eds.), *Caregiving, cultural and cognitive perspectives on secure-base behavior and working models: New growing points of attachment theory and research*, 60 (2-3, Serial No. 244), 310-329.
- Bretherton, I., & Mullholland, K. A. (1999). Internal working models in attachment relationships: A construct revisited. In J. Cassidy & P. R. Shaver (Eds.), *Handbook of attachment: Theory, research and critical applications* (pp. 89-111). New York: Guilford Press.
- Brittlebank, A. D., Scott, J., Williams, J. M., & Perrier, I. N. (1993). Autobiographical memory in depression: State or trait marker? *British Journal of Psychiatry*, 162, 118-121.
- Bronfenbrenner, U. (1979). *The ecology of human development*. Cambridge, MA: Harvard University Press.
- Bronfenbrenner, U. (1996). *The ecology of human development: experiments by nature and design*. Cambridge, Mass.: Harvard University Press.
- Brook, J., Whiteman, M., & Zheng, L. (2002). Intergenerational transmission of risks for problem behaviour. *Journal of Abnormal Child Psychology*, 30, 65-76.
- Brown, C., Schulberg, H. C., Madonia, M. J., Shear, M. K., & Houck, P. R. (1996). Treatment outcomes for primary care patients with major depression and lifetime anxiety disorders. *American Journal of Psychiatry*, 153, 1293-1300.
- Brown, G. W., Birley, J. L., & Wing, J. K. (1972). Influence of family life on the course of schizophrenic disorders: A replication. *British Journal of Psychiatry*, 121, 241-258.
- Brown, T., Chorpita, B. F., & Barlow, D. H. (1998). Structural relationships among dimensions of the DSM-IV anxiety and mood disorders and dimensions of negative affect, positive affect and autonomic arousal. *Journal of Abnormal Psychology*, 107, 179-192.
- Brown, T. A., Barlow, D. H., & Liebowitz, M. R. (1994). The empirical basis of generalised anxiety disorder. *American Journal of Psychiatry*, 151(9), 1272-1280.
- Brown, T. A., Campbell, L. A., Lehman, C. L., Grisham, J. R., & Mancill, R. B. (2001). Current and lifetime comorbidity of the DSM-IV anxiety and mood disorders in a large clinical sample. *Journal of Abnormal Psychology*, 110(4), 585-599.
- Bruch, M. A., & Heimberg, R. G. (1994). Differences in perceptions of parental and personal characteristics between generalised and non-generalised social phobics. *Journal of Anxiety Disorders*, 8, 155-168.

- Bryant, B. K., & Trockel, J. F. (1976). Personal history of control of psychological stress related to locus of control orientation among college women. *Journal of Consulting and Clinical Psychology, 44*, 266-271.
- Burger, J. M. (1989). Negative reactions to increases in perceived personal control. *Journal of Personality and Social Psychology, 56*, 246-256.
- Burhans, K. K., & Dweck, C. S. (1995). Helplessness in early childhood: The role of contingent worth. *Child Development, 66*, 1719-1738.
- Burke, K. C., Burke, J. D., Jr., Regier, D. A., & Rae, D. S. (1990). Age at onset of selected mental disorders in five community populations. *Archives of General Psychiatry, 47*, 511-518.
- Burnham, J. J., & Gullone, E. (1997). The Fear Survey Schedule for Children-II: A psychometric investigation with American data. *Behaviour Research and Therapy, 35*, 165-173.
- Buss, A. H., & Plomin, R. (1984). *Temperament: Early developing personality traits*. Hillsdale NJ: Erlbaum.
- Cafferty, T. P., Davis, K. E., Medway, F. J., O'Hearn, R. E., & Chappell, K. D. (1994). Reunion dynamics among couples separated during Operation Desert Storm: An attachment theory analysis. In K. Bartholomew & D. Perlman (Eds.), *Advances in personal relationships* (Vol. 5, pp. 309-330). London: Jessica Kingsley.
- Campos, J. J., Barrett, K. C., Lamb, M. E., Goldsmith, H. H., & Stenberg, C. (1983). Socioemotional development. In P. H. Mussen (Ed.), *Handbook of child psychology* (4th ed., pp. 783-815). New York: Wiley.
- Cantwell, D. P., & Baker, L. (1989). Stability and natural history of DSM-III childhood diagnoses. *Journal of the American Academy of Child and Adolescent Psychiatry, 28*, 691-700.
- Carlson, E. A., & Sroufe, L. A. (1995). Contribution of attachment theory to developmental psychopathology. In D. Cicchetti & D. Cohen (Eds.), *Developmental psychopathology: Vol 1. Theory and methods* (pp. 581-617). New York: Wiley.
- Carnelley, K., Pietromonaco, P., & Jaffe, K. (1994). Depression, working models of others and relationship functioning. *Journal of Personality and Social Psychology, 66*, 127-140.
- Carton, J. S., & Nowicki, S. (1994). Antecedents of individual differences in locus of control of reinforcement: A critical review. *Genetic, Social and General Psychology Monographs, 120*, 31-81.
- Carver, C. S. (1989). How should multifaceted personality constructs be tested? Issues illustrated by self-monitoring, attributional style and hardiness. *Journal of Personality and Social Psychology, 56*, 577-585.
- Caspi, A. (2000). The child is father on the man: Personality continuities from childhood to adulthood. *Journal of Personality and Social Psychology, 78*, 158-172.
- Caspi, A., Elder, G. H., & Bem, D. J. (1988). Moving away from the world: Life-course patterns of shy children. *Developmental Psychology, 24*, 824-831.
- Caspi, A., Elder, G. H. J., & Herbener, E. S. (1990). Childhood personality and the prediction of life-course patterns. In L. N. Robbins & M. Rutter (Eds.), *Straight and devious pathways from childhood to adulthood*. New York: Cambridge University Press.

- Caspi, A., Henry, B., McGee, R., Moffitt, T. E., & Silva, P. (1995). Temperamental origins of child and adolescent behavior problems: From age three to age fifteen. *Child Development, 66*, 55-68.
- Caspi, A., Moffitt, T. E., Newman, D. L., & Silva, P. A. (1996). Behavioral observation at age 3 years predict adult psychiatric disorders. *Archives of General Psychiatry, 53*, 1033-1039.
- Caspi, A., & Silva, P. A. (1995). Temperamental qualities at age three predict personality traits in young adulthood: Longitudinal evidence from a birth cohort. *Developmental Psychology, 66*, 486-498.
- Cassidy, J. (1988). Child-mother attachment and the self in six-year-olds. *Child Development, 59*, 121-134.
- Cassidy, J. (1995). Attachment and generalised anxiety disorder. In D. Cicchetti & S. L. Toth (Eds.), *Rochester symposium on developmental psychopathology; Emotion, cognition and representation* (Vol. 6, pp. 343-370). Rochester, NY: University of Rochester Press.
- Cassidy, J., & Berlin, L. J. (1994). The insecure/ambivalent pattern of attachment: theory and research. *Child Development, 65*, 971-991.
- Chandler, T. A., Wolf, F. M., Cook, B., & Dugovics, D. A. (1980). Parental correlates of locus of control in fifth graders: An attempt at experimentation in the home. *Merrill-Palmer Quarterly, 26*, 183-195.
- Chansky, T. E., & Kendall, P. C. (1997). Social expectancies and self-perceptions in anxiety-disordered children. *Journal of Anxiety Disorders, 11*, 347-363.
- Cheek, J. M., & Buss, A. H. (1981). Shyness and sociability. *Journal of Personality and Social Psychology, 41*, 330-339.
- Chess, S., & Thomas, A. (1982). Infant bonding: Mystique and reality. *Journal of Orthopsychiatry, 5*, 213-222.
- Chorpita, B. F. (2001). Control and the development of negative emotion. In M. W. Vasey & M. R. Dadds (Eds.), *The developmental psychopathology of anxiety* (pp. 112-142). New York: Oxford University Press.
- Chorpita, B. F. (2002). The tripartite model and dimensions of anxiety and depression: An examination of structure in a large school sample. *Journal of Abnormal Child Psychology, 30*(2), 177-190.
- Chorpita, B. F., Albano, A. M., & Barlow, D. H. (1998). The structure of negative emotions in a clinical sample of children and adolescents. *Journal of Abnormal Psychology, 107*(1), 74-85.
- Chorpita, B. F., & Barlow, D. H. (1998). The development of anxiety: The role of control in the early environment. *Psychological Bulletin, 124*, 3-21.
- Chorpita, B. F., Brown, T., & Barlow, D. H. (1998). Perceived control as a mediator of family environment in etiological models of childhood anxiety. *Behaviour Therapy, 29*, 457-476.
- Chorpita, B. F., & Daleiden, E. L. (2002). Tripartite dimensions of emotion in a child clinical sample: Measurement strategies and implications for clinical utility. *Journal of Consulting and Clinical Psychology, 70*(5), 1150-1160.

- Chorpita, B. F., Plummer, C. P., & Moffitt, C. E. (2000). Relations of tripartite dimensions of emotion to childhood anxiety and mood disorders. *Journal of Abnormal Child Psychology*, 28, 299-310.
- Chorpita, B. F., Tracey, S., Brown, T. A., Collica, T. J., & Barlow, D. H. (1997). Assessment of worry in childhood anxiety and mood disorders: An adaptation of the Penn State Worry Questionnaire. *Behaviour Research and Therapy*, 35, 569-581.
- Chorpita, B. F., Yim, L. M., Moffitt, C. E., Umemoto, L. A., & Francis, S. E. (2000). Assessment of symptoms of DSM-IV anxiety and depression in children: A Revised Child Anxiety and Depression Scale. *Behaviour Research and Therapy*, 38, 835-855.
- Chou, C., & Bentler, P. M. (1995). Estimates and tests in structural equation modelling. In R. H. Hoyle (Ed.), *Structural equation modelling: Concepts, issues, and applications* (pp. 37-54). London: Sage.
- Cicchetti, D., & Cohen, D. J. (1995). Perspectives on developmental psychopathology. In D. Cicchetti & D. Cohen (Eds.), *Developmental psychopathology: Theory and methods* (Vol. 1, pp. 3-20). New York: Wiley.
- Cicchetti, D., Rogosch, F. A., & Toth, S. L. (1997). Ontogenesis, depressotypic organisation and the depressive spectrum. In S. S. Luthar & J. A. Burack & D. Cicchetti & J. R. Weisz (Eds.), *Developmental psychopathology: Perspectives on adjustment, risk and disorder* (pp. 273-316). Cambridge: Cambridge University Press.
- Cicchetti, D., & Toth, S. L. (1997). Transactional ecological systems in developmental psychopathology. In S. S. Luthar & J. A. Burack & D. Cicchetti & J. R. Weisz (Eds.), *Developmental psychopathology: Perspectives on adjustment, risk and disorder* (pp. 317-349). Cambridge: Cambridge University Press.
- Clark, D. A., Beck, A. T., & Stewart, B. (1990). Cognitive specificity and positive-negative affectivity: Complementary or contradictory views on anxiety and depression? *Journal of Abnormal Psychology*, 99, 148-155.
- Clark, L. A. (1989). The anxiety and depressive disorders: descriptive psychopathology and differential diagnosis. In P. C. Kendall & D. Watson (Eds.), *Anxiety and depression: Distinctive and overlapping features* (pp. 83-129). San Diego: Academic.
- Clark, L. A., & Watson, D. (1991). Tripartite model of anxiety and depression: Psychometric evidence and taxonomic implications. *Journal of Abnormal Psychology*, 100, 316-336.
- Clark, L. A., Watson, D., & Mineka, S. (1994). Temperament, personality, and the mood and anxiety disorders. *Journal of Abnormal Psychology*, 103, 103-116.
- Cloninger, C. R. (1986). A unified biopsychosocial theory of personality and its role in the development of anxiety states. *Psychiatric Development*, 3, 167-226.
- Cobham, V. E., Dadds, M. R., & Spence, S. H. (1998). The role of parental anxiety in the treatment of childhood anxiety. *Journal of Consulting and Clinical Psychology*, 66, 893-905.
- Coiro, M. J., & Emery, R. E. (1998). Do marriage problems affect fathering more than mothering? A quantitative and qualitative review. *Clinical Child and Family Psychology Review*, 1, 23-40.
- Colapinto, J. (1991). Structural family therapy. In A. S. Gurman & D. P. Kniskern (Eds.), *Handbook in family therapy* (Vol. II, pp. 417-443). New York: Brunner/Mazel.

- Cole, D., Peeke, L., Martin, J., Truglio, R., & Seroczynski, A. (1998). A longitudinal look at the relation between depression and anxiety in children and adolescents. *Journal of Consulting and Clinical Psychology, 66*(3), 451-460.
- Cole, D., Truglio, R., & Peeke, L. (1997). Relation between symptoms of anxiety and depression in children: A multitrait-multimethod-multigroup assessment. *Journal of Consulting and Clinical Psychology, 65*, 110-119.
- Cole, D. A., Jacquez, F. M., & Maschman, T. L. (2001). Social origins of depressive cognitions: A longitudinal study of self-perceived competence in children. *Cognitive Therapy and Research, 25*(4), 377-395.
- Cole, D. A., Martin, J. M., Peeke, L. G., Seroczynski, A. D., & Hoffman, K. (1998). Are cognitive errors of underestimation predictive or reflective of depressive symptoms in children: A longitudinal study. *Journal of Abnormal Psychology, 107*, 197-218.
- Cole, D. A., & McPherson, A. E. (1993). Relation of family subsystems to adolescent depression: Implementing a New Family Assessment Strategy. *Journal of Family Psychology, 7*(1), 119-133.
- Cole, D. A., & Rehm, L. P. (1986). Family interaction patterns and childhood depression. *Journal of Abnormal Child Psychology, 14*, 297-314.
- Cole, D. A., & Turner, J., J.E. (1993). Models of cognitive mediation and moderation in child depression. *Journal of Abnormal Psychology, 102*(2), 271-281.
- Collins, N. L., & Feeney, B. C. (2000). A safe haven: An attachment theory perspective on support seeking and caregiving in intimate relationships. *Journal of Personality and Social Psychology, 78*(6), 1053-1073.
- Collins, W. A., Harris, M. L., & Susman, A. (1995). Parenting during middle childhood. In M. Bornstein (Ed.), *Handbook of parenting* (Vol. 1, pp. 65-89). Mahwah, NJ: Erlbaum.
- Compas, B. E. (1987). Coping with stress during childhood and adolescence. *Psychological Bulletin, 101*, 393-403.
- Compas, B. E., Banez, G. A., Malcarne, V. L., & Worsham, N. (1991). Perceived control and coping with stress: A developmental perspective. *Journal of Social Issues, 47*, 23-34.
- Compas, B. E., Connor-Smith, J. K., Saltzman, H., Thomsen, A. H., & Wadsworth, M. E. (2001). Coping with stress during childhood and adolescence: problems, progress, and potential in theory and research. *Psychological Bulletin, 127*, 87-127.
- Conger, K. J., Conger, R. D., & Scaramella, L. V. (1997). Parents, siblings, psychological control, and adolescent adjustment. *Journal of Adolescent Research, 12*, 113-138.
- Coplan, J. D., Trost, R. C., Owens, M. J., Cooper, T. B., Gorman, J. M., Nemeroff, C. B., & Rosenblum, I. A. (1998). Cerebrospinal fluid concentrations of somatostatin and biogenic amines in growing primates reared by mothers exposed to manipulated foraging conditions. *Archives of General Psychiatry, 55*, 473-477.
- Cowan, P. A., Cohn, D. A., Pape-Cowan, C. P., & Pearson, J. L. (1996). Parents' attachment histories and children's externalising and internalising behaviour: Exploring family systems models of linkage. *Journal of Consulting and Clinical Psychology, 64*, 53-63.
- Crandall, V. C., Katkovsky, W., & Crandall, V. J. (1965). Children's belief in their own control of reinforcements in intellectual-academic achievement situations. *Child Development, 36*, 91-109.

- Craske, M. G. (1999). *Anxiety Disorders: Psychological approaches to theory and treatment*. Colorado: Westview Press.
- Crockenberg, S., & Litman, C. (1990). Autonomy as competence in 2-year-olds: Maternal correlates of child defiance, compliance and self-assertion. *Developmental Psychology*, 26, 961-971.
- Crook, T., Raskin, A., & Elliot, J. (1981). Parent-child relationships and adult depression. *Child Development*, 52, 950-957.
- Crowley, S. L., & Emerson, E. N. (1996). Discriminant validity of self-report anxiety and depression in children: Negative affectivity or independent constructs? *Journal of Clinical Child Psychology*, 25, 139-146.
- Cummings, E. M., & Wilson, A. (1999). Contexts of marital conflict and children's emotional security. Exploring the distinction between constructive and destructive conflict from the children's perspective. In M. Cox & J. Brooks-Gunn (Eds.), *Conflict and closeness in families: Causes and consequences* (pp. 105-129). Mahwah, NJ: Erlbaum.
- Dadds, M. R. (1995). *Families, children and the development of dysfunction*. London: Sage Publications.
- Dadds, M. R., & Barrett, P. M. (1996). Family process in childhood anxiety and depression. *Behaviour Change*, 13, 231-239.
- Dadds, M. R., Barrett, P. M., & Cobham, V. E. (1997). Anxiety disorders. In T. H. Ollendick (Ed.), *Comprehensive clinical psychology: Children and adolescents clinical formulation and treatment* (Vol. 4, pp. 112-136). Oxford: Elsevier Science.
- Dadds, M. R., Barrett, P. M., Rapee, R. M., & Ryan, S. (1996). Family process and child anxiety and aggression: An observational analysis. *Journal of Abnormal Child Psychology*, 24, 715-734.
- Dadds, M. R., & Powell, M. B. (1991). The relationship of interparental conflict and marital adjustment to aggression, anxiety and immaturity in aggressive and nonclinic children. *Journal of Abnormal Child Psychology*, 19, 553-567.
- Dadds, M. R., & Roth, J. H. (2001). Family processes in the development of anxiety problems. In M. W. Vasey & M. R. Dadds (Eds.), *The developmental psychopathology of anxiety* (pp. 278-303). New York: Oxford University Press.
- Dadds, M. R., Sanders, M. R., Morrison, M., & Rebgetz, M. (1992). Childhood depression and conduct disorder: II. An analysis of family interaction patterns in the home. *Journal of Abnormal Psychology*, 101, 505-513.
- Dadds, M. R., Spence, S. H., Holland, D. E., Barrett, P. M., & Laurens, K. (1997). Prevention and early intervention for anxiety disorders: A controlled trial. *Journal of Consulting and Clinical Psychology*, 65, 627-635.
- Daniels, D., & Plomin, R. (1985). Origins of individual differences in infant shyness. *Developmental Psychology*, 21, 118-121.
- Daniels, D., Plomin, R., & Greenhalgh, J. (1984). Correlates of difficult temperament in infancy. *Child Development*, 55(4), 1184-1194.
- Darling, N., & Steinberg, L. (1993). Parenting style as context: An integrative model. *Psychological Bulletin*, 113, 487-496.

- Davidson, R. J. (2000). Affective style, psychopathology and resilience: Brain mechanisms and plasticity. *American Psychologist*, 55(11), 1196-1214.
- Davidson, R. J., & Fox, N. A. (1989). Frontal brain asymmetry predicts infants' response to maternal separation. *Journal of Abnormal Psychology*, 98, 127-131.
- Davidson, R. J., Jackson, D. C., & Kalin, N. H. (2000). Emotion, plasticity, context and regulation: Perspectives from affective neuroscience. *Psychological Bulletin*, 126, 890-909.
- Davies, P. T., & Cummings, E. M. (1994). Marital conflict and child adjustment: An emotional security hypothesis. *Psychological Bulletin*, 116, 387-411.
- Davis, M. H. (1998). Are different parts of the extended amygdala involved in fear versus anxiety? *Biological Psychiatry*, 44, 1239-1247.
- Davis, M. H., Morris, M. M., & Kraus, L. A. (1998). Relationship-specific and global perceptions of social support: Associations with well-being and attachment. *Journal of Personality and Social Psychology*, 74, 468-481.
- Davis, W. L., & Phares, E. J. (1969). Parental antecedents of internal-external control of reinforcement. *Psychological Reports*, 24, 427-436.
- Davis, W. L., & Phares, E. J. (1969). Parental antecedents of internal-external control of reinforcement. *Psychological Reports*, 24, 427-436.
- de Ross, R., Marrinan, S., Schattner, S., & Gullone, E. (1999). The relationship between perceived family environment and psychological wellbeing: Mother, father and adolescent reports. *Australian Psychologist*, 34, 58-63.
- Deci, E. L., & Ryan, R. M. (2002). *Handbook of self-determination research*. Rochester, NY: University of Rochester Press.
- Demo, D. H., & Acock, A. C. (1996). Family structure, family process and adolescent well-being. *Journal of Research on Adolescence*, 6, 457-488.
- Demo, D. H., & Cox, M. J. (2000). Families with young children: A review of research in the 1990's. *Journal of Marriage and the Family*, 62, 879-896.
- Dent, J., & Teasdale, J. D. (1988). Negative cognition and the persistence of depression. *Journal of Abnormal Psychology*, 97, 29-34.
- DeWolf, M. S., & van IJzendoorn, M. H. (1997). Sensitivity and attachment: A meta-analysis of parental antecedents of infant attachment. *Child Development*, 68, 571-591.
- Diehl, M., Elnick, A. B., Bourbeau, L. S., & Labouvie-Vief, G. (1998). Adult attachment styles: Their relations to family context and personality. *Journal of Personality and Social Psychology*, 74(6), 1656-1669.
- Dienstbier, R. A. (1989). Arousal and physiological toughness: Implications for mental and physical health. *Psychological Review*, 96(1), 84-100.
- D'Imperio, R. L., Dubow, E. F., & Ippolito, M. F. (2000). Resilient and stress-affected adolescents in an urban setting. *Journal of Clinical Child Psychology*, 29, 129-142.
- DiNardo, P. A., & Barlow, D. H. (1990). Syndrome and symptom co-occurrence in the anxiety disorders. In J. D. Maser & C. R. Cloninger (Eds.), *Comorbidity of mood and anxiety disorders* (pp. 205-230). Washington, D.C: American Psychiatric Press.
- Dobson, K. S. (1985). The relationship between anxiety and depression. *Clinical Psychology Review*, 5, 307-324.

- DuBois, D. L., Felner, R. D., Brand, S., Adan, A. M., & Evans, E. G. (1992). A prospective study of life stress, social support and adaptation in early adolescence. *Child Development*, 63, 542-557.
- Dubow, E., & Tisak, J. (1989). The relation between stressful life events and adjustment in elementary school children: the role of social support and social problem-solving skills. *Child Development*, 60, 1412-1423.
- Dubow, E. F., Edwards, S., & Ippolito, M. F. (1997). Life stressors, neighbourhood, disadvantage and resources: A focus on inner-city children's adjustment. *Journal of Clinical Child Psychology*, 26, 130-144.
- Dumas, J., LaFreniere, P., & Serketich, W. (1995). "Balance of power": A transactional analysis of control in mother-child dyads involving socially competent, aggressive and anxious children. *Journal of Abnormal Psychology*, 104(1), 104-113.
- Easterbrooks, M. A., Cummings, E. M., & Emde, R. N. (1994). Young children's responses to constructive marital disputes. *Journal of Family Psychology*, 8, 160-169.
- Eccles, J. S., Wigfield, A., Harold, R. D., & Blumenfeld, P. C. (1993). Age and gender differences in children's achievement self-perceptions during the elementary school years. *Child Development*, 64, 830-847.
- Egeland, B., & Farber, E. (1984). Infant-mother attachment: Factors related to its development and changes over time. *Child Development*, 55, 753-771.
- Eley, T. C. (2001). Contributions of behavioral genetics research: Quantifying genetic, shared environmental and non-shared environmental influences. In M. W. Vasey & M. R. Dadds (Eds.), *The developmental psychopathology of anxiety* (pp. 45-59). New York: Oxford University Press.
- Erickson, M. F., Sroufe, L. A., & Egeland, B. (1985). The relationship between quality of attachment and behavior problems in preschool in a high-risk sample. In I. Bretherton & E. Waters (Eds.), *Growing points of attachment theory and research; Monographs of the Society for Research in Child Development* (Vol. 50, pp. Nos.1-2, Serial No. 209).
- Evans, G. E., Shapiro, D. H., & Lewis, M. (1993). Specifying dysfunctional mismatches between different control dimensions. *British Journal of Psychology*, 84, 255-273.
- Eysenck, H. J. (1967). *The biological basis of personality*. Springfield, Ill: Charles C. Thomas.
- Eysenck, H. J. (1981). *A model for personality*. New York: Springer-Verlag.
- Farrell, M. P., & Barnes, G. M. (1993). Family systems and social support: A test of the effects of cohesion and adaptability on the functioning of parents and adolescents. *Journal of Marriage and the Family*, 55, 119-132.
- Fauber, R. L., & Long, N. (1991). Children in context: The role of the family in child psychotherapy. *Journal of Consulting and Clinical Psychology*, 59(6), 813-820.
- Feehan, M., McGee, R., Williams, S. M., & Nada-Raja, S. (1995). Models of adolescent psychopathology: Childhood risk and transition to adulthood. *Journal of the American Academy of Child and Adolescent Psychiatry*, 34, 670-679.
- Feeney, J. A. (1998). Adult attachment and relationship-centred anxiety: Responses to physical and emotional distancing. In J. A. Simpson & W. S. Rholes (Eds.), *Attachment theory and close relationships* (pp. 189-218). New York: Guilford Press.

- Fendrich, M., Warner, V., & Weisman, M. M. (1990). Family risk factors, parental depression and psychopathology in offspring. *Developmental Psychology*, 26, 40-50.
- Fergusson, D. M. (1995). A brief introduction to structural equation models. In F. C. Verhulst & M. Koot (Eds.), *The epidemiology of child and adolescent psychopathology*. New York: Oxford University Press.
- Fergusson, D. M., Horwood, L. J., & Lynskey, M. T. (1993). Prevalence and comorbidity of DSM-III-R diagnoses in a birth cohort of 15 year olds. *Journal of the American Academy of Child and Adolescent Psychiatry*, 32, 1127-1134.
- Fergusson, D. M., & Lynskey, M. T. (1996). Adolescent Resiliency to Family Adversity. *Journal of Child Psychology & Psychiatry & Allied Disciplines*, 37(3), 281-292.
- Fields, L., & Prinz, R. J. (1997). Coping and adjustment during childhood and adolescence. *Clinical Psychology Review*, 17(8), 937-976.
- Fincham, F. D. (1994). Understanding the association between marital conflict and child adjustment. An overview. *Journal of Family Psychology*, 8, 123-127.
- Fincham, F. D., Grych, J. H., & Osborne, L. N. (1994). Does marital conflict cause child maladjustment? Directions and challenges for longitudinal research. *Journal of Family Psychology*, 8, 128-140.
- Finnegan, R. A., Hodges, E. V. E., & Perry, D. G. (1996). Preoccupied and avoidant coping during middle childhood. *Child Development*, 67, 1318-1328.
- Flinn, M. V., & England, B. G. (1995). Childhood stress and family environment. *Current Anthropology*, 36, 854-866.
- Fonagy, P., Leigh, T., Steele, M., Steele, H., Kennedy, R., Mattoon, G., Target, M., & Gerber, A. (1996). The relation of attachment status, psychiatric classification and response to psychotherapy. *Journal of Consulting and Clinical Psychology*, 64, 22-31.
- Fonagy, P., Steele, H. & Steele, M. (1991). Maternal representations of attachment during pregnancy predict the organization of infant-mother attachment at one year of age. *Child Development*, 62, 891-905.
- Fonessa, A. C., Yule, W., & Erol, N. (1994). Cross-cultural issues. In R. H. Ollendick & N. J. King & W. Yule (Eds.), *International handbook of phobic and anxiety disorders in children and adolescents* (pp. 67-84). New York: Plenum Press.
- Fox, N. A. (1989). Psychophysiological correlates of emotional reactivity during the first year of life. *Developmental Psychology*, 25, 364-372.
- Francis, D., Diorio, J., Liu, D., & Meaney, M. J. (1999). Nongenomic transmission across generations of maternal behaviour and stress responses in the rat. *Science*, 286, 1155-1158.
- Francis, G. (1990). Anxiety disorders. In A. S. Bellack & M. Hersen & A. E. Kazdin (Eds.), *International handbook of behaviour modification and therapy* (2 ed., pp. 633-647). New York: Plenum Press.
- Franz, C. E., McClelland, D., & Wienberger, J. (1991). Childhood antecedents of conventional social accomplishment in midlife adults: A 36-year prospective study. *Journal of Personality and Social Psychology*, 60, 586-595.
- Freud, S. (1926/1936). Inhibitions, symptoms and anxiety. Authotized translation by Anix Strachey, London: Hogarth Press.

- Fury, G., Carlson, E. A., & Sroufe, L. A. (1997). Children's representations of attachment relationships in family drawings. *Child Development, 68*, 1154-1164.
- Garber, J., Robinson, N. S., & Valentiner, D. (1997). The relation between parenting and adolescent depression: Self-worth as a mediator. *Journal of Adolescent Research, 12*, 12-33.
- Garmezy, N. (1986). Developmental aspects of children's responses to the stress of separation and loss. In M. Rutter & C. E. Izard & P. B. Reid (Eds.), *Depression in young people: Developmental and clinical perspectives*. New York: McGraw-Hill.
- Garmezy, N., Masten, A. S., & Tellegen, A. (1984). Studies of stress-resistant children: A building block for developmental psychopathology. *Child Development, 55*, 97-111.
- Garmezy, N., & Rutter, M. (1983). *Stress, coping and development in children*. New York: McGraw-Hill.
- Gauze, C., Bukowski, W. M., Aquan-Assee, J., & Sippola, L. K. (1996). Interactions between family environment and friendship and associations with self-perceived well-being during adolescence. *Child Development, 67*(5), 2201-2216.
- Ge, X., Conger, R. D., Lorenz, F. O., Shanahan, M., & Elder, G. H. (1995). Mutual influences in parent and adolescent psychological distress. *Developmental Psychology, 31*, 406-419.
- Geer, J. H., Davison, G. C., & Gatchel, R. I. (1970). Reduction of stress in humans through nonveridical perceived control of aversive stimulation. *Journal of Personality and Social Psychology, 16*, 731-738.
- George, C., & Solomon, J. (1989). Internal working models of caregiving and security of attachment at age 6. *Infant Mental Health Journal, 10*, 222-237.
- George, C., & Solomon, J. (1996). Representational models of relationships: Links between caregiving and attachment. *Infant Mental Health Journal, 17*, 198-216.
- George, C., & Solomon, J. (1999). Attachment and caregiving: The caregiving behavioural system. In J. Cassidy & P. R. Shaver (Eds.), *Handbook of attachment: Theory, research and clinical applications* (pp. 649-670). New York: Guilford Press.
- Gerlsma, C., Emmelkamp, P. M. G., & Arrindell, W. A. (1990). Anxiety, depression and perception of early parenting: A meta-analysis. *Clinical Psychology Review, 10*, 251, 277.
- Gest, S. D. (1997). Behavioural inhibition: Stability and associations with adaptation from childhood to early adulthood. *Journal of Personality and Social Psychology, 72*, 467-475.
- Ginsburg, G. S., La Greca, A. M., & Silverman, W. K. (1998). Social anxiety in children with anxiety disorders: relation with social and emotional functioning. *Journal of Abnormal Child Psychology, 26*(3), 175-186.
- Goisman, R. M., Allsworth, J., Rogers, M. P., Warshaw, M. G., Goldenberg, I., Vasile, R. G., Rodriguez-Villa, F., Mallya, G., & Keller, M. B. (1998). Simple phobia as a comorbid anxiety disorder. *Depression and Anxiety, 7*, 105-112.
- Goldsmith, H. H., Buss, A. H., Plomin, R., Rothbart, M. K., Thomas, A., Chess, S., Hinde, R. A., & McCall, R. B. (1987). Roundtable: What is a temperament? Four approaches. *Child Development, 58*, 505-529.
- Goodman, R. (1997). The Strengths and Difficulties Questionnaire: A research note. *Journal of Child Psychology and Psychiatry, 38*, 581-586.

- Goodman, R., & Scott, S. (1999). Comparing the Strengths and Difficulties Questionnaire and the Child Behaviour Checklist: Is small beautiful? *Journal of Abnormal Child Psychology*, 27, 17-24.
- Gordis, E. B., Margolin, G., & John, R. S. (1997). Marital aggression, observed parental hostility and child behaviour during triadic family interaction. *Journal of Family Psychology*, 11, 76-89.
- Gordon, D. A., Nowicki, S., & Wickern, F. (1981). Observed maternal and child behaviors in a dependency-producing task as a function of children's locus of control orientation. *Merrill-Palmer Quarterly*, 27, 43-51.
- Gotlib, I. H., Mount, J. H., Cordie, N. I., & Whiffen, V. E. (1988). Depression and perception of early parenting: A longitudinal investigation. *British Journal of Psychiatry*, 152, 24-27.
- Graham-Bermann, S. A., Coupet, S., Egler, L., Mattis, J., et al. (1996). Interpersonal relationships and adjustment of children in homeless and economically distressed families. *Journal of Clinical Child Psychology*, 25(3), 250-261.
- Gray, J. A. (1982). *The neuropsychology of anxiety*. New York: Oxford University Press.
- Gray, J. A. (1987). *The psychology of fear and stress*. New York: Cambridge University Press.
- Gray, J. A. (1990). Brain systems that mediate both emotion and cognition. *Cognition and Emotion*, 4, 269-288.
- Gray, J. A., & McNaughton, N. (1996). The neuropsychology of anxiety: Reprise. In D. A. Hope (Ed.), *Nebraska Symposium on Motivation: Perspectives on anxiety, panic and fear* (Vol. 43). Lincoln: University of Nebraska Press.
- Gray, M. R., & Steinberg, L. (1999). Unpacking authoritative parenting: Reassessing a multidimensional construct. *Journal of Marriage and the Family*, 61, 574-587.
- Greenberg, M. T. (1999). Attachments and psychopathology in childhood. In J. Cassidy & P. R. Shaver (Eds.), *Handbook of attachment* (pp. 469-496). New York: Guilford.
- Greenberger, E., & Chen, C. (1996). Perceived family relationships and depressed mood in early and late adolescence: A comparison of European and Asian Americans. *Developmental Psychology*, 32, 707-716.
- Griffin, D. W., & Bartholomew, K. (1994). Models of the self and other: Fundamental dimensions underlying measures of adult attachment. *Journal of Personality and Social Psychology*, 67, 430-445.
- Gruner, K., Muris, P., & Merckelbach, H. (1999). The relationship between anxious rearing behaviours and anxiety disorders symptomatology in normal children. *Journal of Behavior Therapy and Experimental Psychiatry*, 30, 27-35.
- Grych, J. H., & Fincham, F. D. (1990). Marital conflict and children's adjustment: A cognitive-contextual framework. *Psychological Bulletin*, 108, 267-290.
- Gullone, E. (2000). The development of normal fear: A century of research. *Clinical Psychology Review*, 20(4), 429-451.
- Gullone, E., & King, N. J. (1997). Three year follow-up of normal fear in children and adolescents aged 7 to 18 years. *British Journal of Developmental Psychology*, 15, 97-111.
- Gunnar, M. R. (1980). Control, warning signals and distress in infancy. *Developmental Psychology*, 16(4), 281-289.

- Haggerty, R. J., Sherrod, L. R., Garmezy, N., & Rutter, M. E. (1994). *Stress, risk, and resilience in children and adolescents: Processes, mechanisms and interventions*. Cambridge, England: Cambridge University Press.
- Hair, J. F. J., Anderson, R. E., Tatham, R. L., & Black, W. C. (1998). *Multivariate data analysis* (5th ed.). New Jersey: Prentice Hall.
- Haley, J., & Hoffman, L. (1967). *Techniques of family therapy*. New York: Basic Books.
- Hallam, R. S. (1985). *Anxiety: Psychological perspectives on panic and agoraphobia*. New York: Academic.
- Hamilton, C. E. (2000). Continuity and discontinuity of attachment from infancy through adolescence. *Child Development*, 71, 690-694.
- Hammen, C., Adrian, C., & Hiroto, D. (1988). A longitudinal test of the attributional vulnerability model in children at risk for depression. *British Journal of Clinical Psychology*, 27, 37-46.
- Han, S. S., Weisz, J. R., & Weiss, B. (2001). Specificity of relations between children's control-related beliefs and internalising and externalising psychopathology. *Journal of Consulting and Clinical Psychology*, 69(2), 240-251.
- Harrison, A. O., Wilson, M. N., Pine, C. J., Chan, S. Q., & Buriel, R. (1990). Family ecologies of ethnic minority children. *Child Development*, 61, 347-362.
- Hart, C. H., Nelson, D. A., Robinson, C. C., Olsen, S. F., & McNeilly-Choque, M. K. (1998). Overt and relational aggression in Russian nursery-school-age children: Parenting style and marital linkages. *Developmental Psychology*, 34, 687-697.
- Harter, S. (1982). The perceived competence scale for children. *Child Development*, 53, 87-97.
- Harter, S. (1985a). Competence as a dimension of self-evaluation: Toward a comprehensive model of self-worth. In R. L. Leahy (Ed.), *The development of the self*. Orlando: Academic Press Inc.
- Harter, S. (1985b). *Manual for the Self-Perception Profile for Children*.: University of Denver.
- Harter, S., Whitesell, N., & Kowalski, P. (1992). Individual differences in the effects of educational transitions on young adolescent's perceptions of competence and motivational orientation. *American Educational Research Journal*, 29, 777-807.
- Hayduk, L. A. (1987). *Structural equation modelling with LISREL: Essentials and advances*. Baltimore: Johns Hopkins University Press.
- Hazan, C., & Shaver, P. R. (1987). Romantic love conceptualised as an attachment process. *Journal of Personality and Social Psychology*, 52, 511-524.
- Hazan, C., & Shaver, P. R. (1994). Deeper into attachment theory: Authors' response. *Psychological Inquiry*, 5(1), 68-79.
- Heckhausen, H., & Schultz, R. (1995). A life-span theory of control. *Psychological Review*, 102, 284-304.
- Heim, C., & Nemeroff, C. B. (1999). The impact of early adverse experiences on brain systems involved in the pathophysiology of anxiety and affective disorders. *Biological Psychiatry*, 46, 1509-1522.

- Hesse, E. (1999). The Adult Attachment Interview: Historical and current perspectives. In J. Cassidy & P. R. Shaver (Eds.), *Handbook of attachment: Theory, research and clinical applications* (pp. 549-560). New York: Guilford Press.
- Hetherington, E. M., Cox, M., & Cox, R. (1985). Long-term effects of divorce and remarriage on the adjustment of children. *Journal of the American Academy of Child Psychiatry*, 24, 518-530.
- Hirschfeld, D. R., Biederman, J., Brody, I., Faraone, S. V., & Rosenbaum, J. F. (1997a). Associations between expressed emotion and child behavioural inhibition and psychopathology. *Journal of the American Academy of Child and Adolescent Psychiatry*, 36, 205-213.
- Hirschfeld, D. R., Biederman, J., Brody, I., Faraone, S. V., & Rosenbaum, J. F. (1997b). Expressed emotion toward children with behavioural inhibition: Associations with maternal anxiety disorders. *Journal of the American Academy of Child and Adolescent Psychiatry*, 36, 910-917.
- Hirschfeld, D. R., J.F., R., Biederman, J., Bolduc, E. A., Faraone, S. V., Snidman, N., Reznick, J. S., & Kagan, J. (1992). Stable behavioural inhibition and its association with anxiety disorders. *Journal of the American Academy of Child and Adolescent Psychiatry*, 31, 103-111.
- Hodges, K. (1990). Depression and anxiety in children: A comparison of self-report questionnaires to clinical interview. *Psychological Assessment*, 2, 376-381.
- Holmbeck, G.N. (1997). Toward terminological, conceptual and statistical clarity in the study of mediators and moderators: Examples from the child-clinical and pediatric psychology literatures, *Journal of Consulting and Clinical Psychology*, 65, 599-610.
- Hoffman, J. A., & Teyber, E. C. (1979). Some relationships between sibling age, space and personality. *Merrill-Palmer Quarterly*, 25, 77-80.
- Hops, H., Lewinsohn, P. M., Andrews, J. A., & Roberts, R. (1990). Psychosocial correlates of depressive symptomatology among high school students. *Journal of Clinical Child Psychology*, 19, 211-220.
- Horwood, J., & Fergusson, D. M. (1998). *Psychiatric disorder and treatment seeking in a birth cohort of young adults: Christchurch Health and Development Study Report to Ministry of Health*. Wellington, NZ: Ministry of Health.
- Howes, C. (1999). Attachment relationships in the context of multiple caregivers. In J. Cassidy & P. R. Shaver (Eds.), *Handbook of attachment: Theory, research and clinical applications* (pp. 671-687). New York: Guilford Press.
- Hox, J. J., & Bechger, T. M. (2000). An introduction to structural equation modelling. *Family Science Review*, 11, 354-373.
- Hoyle, R. H. (1995). *Structural equation modelling: Concepts, issues and applications*. London: Sage.
- Hu, L., & Bentler, P. M. (1999). Cut-off criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural equation modelling*.
- Huberty, T. J. (1997). Anxiety. In G. G. Bear & K. M. Minkee & A. Thomas (Eds.), *Children's needs II: Development, problems and alternatives* (pp. 305-314). Bethesda, Md: National Association of School Psychologists.

- Hudson, J. L., & Rapee, R. M. (2001). Parent-child interactions and anxiety disorders: an observational study. *Behaviour Research and Therapy*, 39, 1411-1427.
- Husain, S. A., & Kashani, J. H. (Eds.). (1992). *Anxiety disorders in children and adolescents*. Washington, DC: American Psychiatric Press.
- Huzziff, C.A. (2004). *An investigative study of a cognitive-behavioural and a behavioural treatment for childhood anxiety disorders*. Unpublished Doctoral Thesis, Massey University, Palmerston North, New Zealand.
- Huzziff, C. A., & Ronan, K. R. (1999). Working with anxious and comorbid disorders in childhood and adolescence. In H. V. Bilsen (Ed.), *Focusing the mind* (pp. 113-129). Wellington: Central Institute of Technology.
- Isabella, R. A. (1993). Origins of attachment: Maternal interactive behaviour across the first year. *Child Development*, 64, 605-621.
- Ishii-Kuntz, M. (2000). Diversity within Asian American families. In D. H. Demo & K. R. Allen & M. A. Fine (Eds.), *The handbook of family diversity* (pp. 274-292). New York: Oxford University Press.
- Izard, C. E. (2002). Translating emotion theory and research into preventive interventions. *Psychological Bulletin*, 128, 796-824.
- Jackson, A. P., Gyamfi, P., Brooks-Gunn, J., & Blake, M. (1998). Employment status, psychological well-being, social support and physical discipline practices in single Black mothers. *Journal of Marriage and the Family*, 60, 894-902.
- Jackson, Y., & Warren, J. (2000). Appraisal, social support, and life events: predicting outcome behavior in school-age children. *Child Development*, 71, 1441-1457.
- Jacobsen, T., & Hofmann, V. (1997). Children's attachment representations: Longitudinal relations to school behaviour and academic competency in middle childhood and adolescence. *Developmental Psychology*, 33, 703-710.
- Jacobwitz, D. B., & Bush, N. F. (1996). Reconstructions of family relationship" Parent-child alliances, personal distress and self-esteem. *Developmental Psychology*, 32, 732-743.
- Jacques, H.A.K. & Mash, E.J. (2004). A test of the tripartite model of anxiety and depression in elementary and high school boys and girls, *Journal of Abnormal Child Psychology*, 32, (1),13-25.
- Joiner Jr., T. E., & Lonigan, C. J. (2000). Tripartite model of depression and anxiety in youth psychiatric inpatients: Relations with diagnostic status and future symptoms. *Journal of Clinical Child Psychology*, 29(3), 372-383.
- Joiner, T., Catanzaro, S., & Laurent, J. (1996). Tripartite structure of positive and negative affect, depression and anxiety, in child psychiatric inpatients. *Journal of Abnormal Psychology*, 105, 401-409.
- Joreskog, K. G., & Sorbom, D. (1993). *LISREL VIII*. Chicago: Scientific Software.
- Kagan, J. (1989). Temperamental contributions to social behavior. *American Psychologist*, 44, 668-674.
- Kagan, J. (1989). Temperamental contributions to social behavior. *American Psychologist*, 44, 668-674.

- Kagan, J. (1994). On the nature of emotion: The development of emotion regulation: Biological and behavioural considerations. *Monographs of the Society for Research in Child Development*, 59, 7-283.
- Kagan, J. (1997). Temperament and the reactions to unfamiliarity. *Child Development*, 68, 139-143.
- Kagan, J. (1998). Biology and the child. In N. Eisenberg (Ed.), *Social, emotional and personality development* (5 ed., Vol. 3, pp. 177-236). New York: Wiley.
- Kagan, J., Reznick, J. S., Clarke, C., Snidman, N., & Garcia-Coll, C. (1984). Behavioural inhibition to the unfamiliar. *Child Development*, 55, 2212-2225.
- Kagan, J., Reznick, J. S., & Snidman, N. (1987). The physiology and psychology of behavioural inhibition in children. *Child Development*, 58, 1459-1473.
- Kagan, J., Reznick, J. S., Snidman, N., Gibbons, J., & Johnson, M. O. (1988). Childhood derivatives of inhibition and lack of inhibition to the unfamiliar. *Child Development*, 59, 1580-1589.
- Kagan, J., & Snidman, N. (1991). Temperamental factors in human development. *American Psychologist*, 48, 856-862.
- Kagan, J., & Snidman, N. (1999). Early childhood predictors of adult anxiety disorders. *Biological Psychiatry*, 46, 1536-1541.
- Kagan, J., Snidman, N., & Arcus, D. M. (1998). Childhood derivatives of high and low reactivity in infancy. *Child Development*, 69, 1483-1493.
- Kalin, N. H., Shelton, S. E., & Davidson, R. J. (2000). Cerebrospinal fluid corticotrophin-releasing hormone levels are elevated in monkeys with patterns of brain activity associated with fearful temperament. *Biological Psychiatry*, 47, 579-585.
- Kandel, E. R. (1983). From metapsychology to molecular biology: Explorations into the nature of anxiety. *American Journal of Psychiatry*, 140, 1277-1293.
- Kaplan, D. (1990). Evaluating and modifying covariance structure models: A review and recommendation. *Multivariate behavioral research*, 25, 137-155.
- Kashani, J. H., & Carlson, G. A. (1987). Seriously depressed preschoolers. *American Journal of Psychiatry*, 144, 348-350.
- Kashani, J. H., Rosenberg, T. K., & Reid, J. C. (1989). Developmental perspectives in child and adolescent depressive symptoms in a community sample. *American Journal of Psychiatry*, 146, 871-875.
- Kaslow, N. J., Gray-Deering, C., & Racusin, G. R. (1994). Depressed children and their families. *Clinical Psychology Review*, 14, 39-59.
- Kaslow, N. J., Stark, K. D., Printz, B., Livingston, R., & Tsai, S. L. (1992). Cognitive Triad Inventory for children: Development and relation to depression and anxiety. *Journal of Clinical Child Psychology*, 21(4), 339-347.
- Katz, L., & Gottman, J. (1993). Patterns of marital conflict predict children's internalising and externalising behaviours. *Developmental Psychology*, 29, 940-950.
- Kazantzis, N., Ronan, K. R., & Deane, F. P. (2001). Concluding causation from correlation: Comment on Burns and Spangler (2000). *Journal of Consulting and Clinical Psychology*, 69(6), 1079-1083.

- Kazdin, A. E., Kraemer, H. C., Kessler, R. C., Kupfer, D. J., & Offord, D. R. (1997). Contributions of risk-factor research to developmental psychopathology. *Clinical Psychology Review, 17*, 375-406.
- Keller, M. B., & Baker, L. (1992). The clinical course of panic disorder and depression. *Journal of Clinical Psychiatry, 53*, 5-8.
- Keller, M. B., Lavori, P., Wunder, J., Beardalee, W. R., Schwartz, C. E., & Roth, J. (1992). Chronic course of anxiety disorders in children and adolescents. *Journal of the American Academy of Child and Adolescent Psychiatry, 31*(595-599).
- Kendall, P. C. (1992). Childhood coping: Avoiding a lifetime of anxiety. *Behavioural Change, 9*, 1-8.
- Kendall, P. C. (1994). Treating anxiety disorders in children: Results of a randomized clinical trial. *Journal of Consulting and Clinical Psychology, 62*, 100-110.
- Kendall, P. C., Chansky, T. E., Kane, M. T., Kim, R. S., Kortlander, E., Ronan, K. R., Sessa, F. M., & Siqueland, L. (1992). *Anxiety disorders in youth: Cognitive-behavioral interventions*. Boston: Allyn & Bacon.
- Kendall, P. C., Flannery-Schroeder, E., Panichelli-Mindel, S. M., Southam-Gerow, M., Henin, A., & Warman, M. (1997). Therapy for youths with anxiety disorders: a second randomized clinical trial. *Journal of Consulting and Clinical Psychology, 65*(3), 366-380.
- Kendall, P. C., & Ronan, K. R. (1990). Assessment of children's anxieties, fears and phobias: Cognitive-behavioral models and methods. In C. Reynolds & R. W. Kamphaus (Eds.), *Handbook of psychological and educational assessment of children* (pp. 223-244). New York: Guilford Press.
- Kendall, P. C., & Southam-Gerow, M. A. (1996). Long-term follow-up of a cognitive-behavioral therapy for anxiety-disordered youth. *Journal of Consulting and Clinical Psychology, 64*(4), 724-730.
- Kendler, K. S. (1996). Major depression and generalised anxiety disorder: same genes, (partly) different environments--revisited. *British Journal of Psychiatry, 168*(Suppl. 30), 68-75.
- Kendler, K. S., Heath, A. C., Martin, N. G., & Eaves, L. J. (1986). Symptoms of anxiety and depression in a volunteer twin population: The etiologic role of genetic and environmental factors. *Archives of General Psychiatry, 43*, 213-221.
- Kendler, K. S., Heath, A. C., Martin, N. G., & Eaves, L. J. (1987). Symptoms of anxiety and symptoms of depression: Same genes, different environments? *Archives of General Psychiatry, 44*, 451-457.
- Kendler, K. S., Neale, M. C., Kessler, R. C., Heath, A. C., & Eaves, L. J. (1992). Generalised anxiety disorder in women: A population-based twin study. *Archives of General Psychiatry, 49*, 267-272.
- Kendler, K. S., Neale, M. C., Kessler, R. C., Heath, A. C., & Eaves, L. J. (1993a). Major depression and phobias: the genetic and environmental sources of comorbidity. *Psychological Medicine, 23*, 361-371.
- Kendler, K. S., Neale, M. C., Kessler, R. C., Heath, A. C., & Eaves, L. J. (1993b). A longitudinal twin study of personality and major depression in women. *Archives of General Psychiatry, 50*, 853-862.

- Kendler, K. S., Walters, E. E., Neale, M. C., Heath, A. C., & Eaves, L. J. (1995). The structure of genetic and environmental risk factors for six major psychiatric disorders in women: Phobic, generalised anxiety disorders, panic disorder, bulimia, major depression and alcoholism. *Archives of General Psychiatry*, 52, 716-722.
- Kennedy, E., Spence, S. H., & Hensley, R. (1989). An examination of the relationship between childhood depression and social competence amongst primary school children. *Journal of Child Psychology and Psychiatry*, 30, 561-573.
- Kerig, P. K., Cowan, P. A., & Cowan, C. P. (1993). Marital quality and gender differences in parent-child interaction. *Developmental Psychology*, 29, 931-939.
- Kerns, K. A., Tomich, A., Aspelmeier, J., & Contreras, J. (2000). Attachment-based assessments of parent-child relationships in middle childhood. *Developmental Psychology*, 36, 614-626.
- King, N. J., Ollendick, T. H., & Gullone, E. (1991). Negative affectivity in children and adolescents: Relations between anxiety and depression. *Clinical Psychology Review*, 11, 441-458.
- King, N. J., Ollier, K., Iaccone, R., Schuster, S., Bays, K., Gullone, E., & Ollendick, T. H. (1989). Child and adolescent fears: An Australian cross-sectional study using the Revised Fear Schedule for Children. *Journal of Child Psychology and Psychiatry*, 30, 775-784.
- Klebanov, P. K., Brooks-Gunn, J., & Duncan, G. J. (1994). Does neighbourhood and family poverty affect mothers' parenting, mental health and social support? *Journal of Marriage and the Family*, 56, 441-455.
- Klein, R. (1994). Anxiety disorders. In M. Rutter & L. Taylor & Hersov (Eds.), *Child and adult psychiatry: Modern approaches* (3 ed., pp. 351-374). London: Blackwell Science.
- Klinnert, M. D., Campos, J. J., Sorce, J. F., Emde, R. N., & Svedja, M. (1983). Emotions as behavior regulators: social referencing in infancy. In R. Plutchik & H. Kellerman (Eds.), *The emotion: Emotions in early development* (Vol. 2). New York: Academic Press.
- Kobak, R. R., & Sceery, A. (1988). Attachment in late adolescence: Working models, affect regulation and representations of self and others. *Child Development*, 59, 135-146.
- Kochanska, G. (1995). Children's temperament, mothers' discipline and security of attachment: Multiple pathways to emerging internalization. *Child Development*, 66, 597-615.
- Koren-Karie, N., Oppenheim, D., Dolev, S., Sher, E., & Etzion-Carasso, A. (2002). Mothers' insightfulness regarding their infants' internal experience: Relations with maternal sensitivity and infant attachment. *Developmental Psychology*, 38, 534-542.
- Kovacs, M. (1981). Rating scales to assess depression in school-aged children. *Acta Paedopsychiatrica*, 4, 305-315.
- Kovacs, M. (1983). *The Child Depression Inventory: A self-rated depression scale for school-aged youngsters*, Unpublished manuscript. Pittsburgh.
- Kovacs, M. (1992). *Children's Depression Inventory*. New York: Multi-Health Systems, Inc.
- Kritzeck, J. (1964). *Anthology of Islamic literature, from the rise of Islam to modern times*. New York: Holt, Rinehart & Winston.
- Krohne, H. W., & Hock, M. (1991). Relationships between restrictive mother-child interactions and anxiety of the child. *Anxiety Research*, 4, 109-124.

- Krueger, R. F., Caspi, A., Moffitt, T. E., Silva, P. A., & McGee, R. (1996). Personality traits are differentially linked to mental disorders: a multi-trait/multi-diagnosis study of an adolescent birth cohort. *Journal of Abnormal Psychology, 105*, 299-312.
- La Freniere, P. J., & Sroufe, L. A. (1985). Profiles of peer competence in the preschool: Interrelations between measures, influence of social ecology and relation to attachment history. *Developmental Psychology, 21*, 56-69.
- La Greca, A. M., Silverman, W. K., Vernberg, E. M., & Prinstein, M. J. (1996). Symptoms of posttraumatic stress in children after Hurricane Andrew: A prospective study. *Journal of Consulting and Clinical Psychology, 64*, 712-723.
- La Greca, A. M., Silverman, W. K., & Wasserstein, S. B. (1998). Children's pre-disaster functioning as a predictor of posttraumatic stress following Hurricane Andrew. *Journal of Consulting and Clinical Psychology, 66*, 883-892.
- LaFreniere, P. J., & Capuano, F. (1997). Preventive intervention as a means of clarifying direction of effects in socialization: Anxious-withdrawn preschoolers case. *Development and Psychopathology, 9*, 551-564.
- LaFreniere, P. J., & Sroufe, L. A. (1985). Profiles of peer competence in the preschool: Interrelations between measures, influence of social ecology and relation to attachment history. *Developmental Psychology, 21*, 56-69.
- Laing, R. D. (1961). *The Self and Others: Further Studies in Sanity and Madness*. London: Tavistock.
- Lang, P. J. (1985). The cognitive psychophysiology of emotion: Fear and anxiety. In A. H. Tuma & J. D. Maser (Eds.), *Anxiety and the anxiety disorders* (pp. 131-170). Hillsdale, NJ: Erlbaum.
- Langer, E. J. (1975). The illusion of control. *Journal of Personality and Social Psychology, 32*, 311-329.
- Laraia, M. T., Stuart, G. W., Frye, L. H., & Lydiard, R. B. (1994). Childhood environment of women having panic disorder with agoraphobia. *Journal of Anxiety Disorders, 8*, 1-17.
- Last, C. G., Hersen, M., Kazdin, A. E., Francis, G., & Grubb, H. J. (1987). Psychiatric illness in mothers of anxious children. *American Journal of Psychiatry, 144*, 1580-1583.
- Last, C. G., Perrin, S., Hersen, M., & Kazdin, A. E. (1996). A prospective study of childhood anxiety disorders. *Journal of the American Academy of Child and Adolescent Psychiatry, 35*, 1502-1510.
- Laurent, J., Catanzaro, S., Joiner, T. E. J., Rudolph, K. D., Potter, K. I., Lambert, S., Osborne, L., & Gathright, T. (1999). A measure of positive and negative affect for children: Scale development and initial validation. *Psychological Assessment, 11*, 326-338.
- Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal and coping*. New York: Springer-Verlag.
- LeDoux, J. E. (1998). Fear and the brain: Where have we been and where are we going. *Biological Psychiatry, 44*, 1229-1238.
- Lefcourt, H. M. (1981). *Research with the locus of control construct: Assessment methods* (Vol. 1). New York: Academic Press.

- Levitt, M. G., Guacci-Franco, N., & Levitt, J. L. (1993). Convoys of social support in middle childhood and early adolescence: Structure and function. *Developmental Psychology, 29*, 811-818.
- Levy, K. N., Blatt, S. J., & Shaver, P. R. (1998). Attachment styles and parental representations. *Journal of Personality and Social Psychology, 74*(2), 407-419.
- Lewinsohn, P. M., Gotlib, I. H., Lewinsohn, M., Seeley, J. R., & Allen, N. B. (1998). Gender differences in anxiety disorders and anxiety symptoms in adolescents. *Journal of Abnormal Psychology, 107*, 109-117.
- Lewinsohn, P. M., Mischel, W., Chaplin, W., & Barton, R. (1980). Social competence and depression: The role of illusory self-perceptions. *Journal of Abnormal Psychology, 89*, 203-212.
- Lewis, M., Feirig, C., McGuffog, C., & Jaskir, J. (1984). Predicting psychopathology in six-year-olds from early social relations. *Child Development, 55*, 123-136.
- Loeb, R. C. (1975). Concomitants of boys' locus of control examined in parent-child interactions. *Developmental Psychology, 11*, 353-358.
- Lonigan, C. J., Carey, M. P., & Finch, A. J. (1994). Anxiety and depression in children and adolescents: Negative affectivity and the utility of self-report. *Journal of Consulting and Clinical Psychology, 62*, 1000-1008.
- Lonigan, C. J., Hooe, E. S., David, C. F., & Kistner, J. A. (1999). Positive and negative affectivity in children: Confirmatory factor analysis of a two-factor model and its relation to symptoms of anxiety and depression. *Journal of Consulting and Clinical Psychology, 67*, 374-380.
- Lonigan, C. J., & Phillips, B. M. (2001). Temperamental influences on the development of anxiety of anxiety disorders. In M. W. Vasey & M. R. Dadds (Eds.), *The developmental psychopathology of anxiety* (pp. 60-91). New York: Oxford University Press.
- Lonigan, C. J., Phillips, B. M. & Hooe, E.S. (2003). Relations of positive and negative affectivity to anxiety and depression in children: Evidence from a latent variable longitudinal study. *Journal of Consulting and Clinical Psychology, 71*, (3), 465-481.
- Lopez, D., & Little, T. (1996). Children's action-control beliefs and emotional regulation in the social domain. *Developmental Psychology, 32*, 299-321.
- Lorion, R. P., Myers, T. G., Bartels, C., & Dennis, A. (1994). Prevention intervention research :Pathways for extending knowledge of child/adolescent health and pathology. In T. H. Ollendick & R. J. Prinz (Eds.), *Advances in Clinical Psychology* (Vol. 16, pp. 109-140). New York: Plenum.
- Lui, D., Diorio, J., Tannenbaum, B., Caldji, C., Francis, D., & Freedman, A. (1997). Maternal care, hippocampal glucocorticoid receptors, and hypothalamic-pituitary-adrenal responses to stress. *Science, 277*, 1659-1662.
- Luster, T., & McAdoo, H. E. (1991). Factors related to the achievement and adjustment of young African American children. *Child Development, 65*, 1080-1094.
- Luthar, S. S. (1991). Vulnerability and resilience: A study of high-risk adolescents. *Child Development, 62*, 600-116.

- Lyons-Ruth, K. (1996). Attachment relationships among children with aggressive behaviour problems: The role of disorganised early attachment strategies. *Journal of Consulting and Clinical Psychology, 64*, 64-73.
- Lyons-Ruth, K., & Jacobvitz, D. (1999). Attachment disorganization: Unresolved loss, relational violence and lapses in behavioural and attentional strategies. In J. Cassidy & P. R. Shaver (Eds.), *Handbook of attachment: Theory, research and clinical applications* (pp. 287-316). New York: Guilford Press.
- Lytton, H., & Romney, D. (1991). Parents' differential socialization of boys and girls: A meta-analysis. *Psychological Bulletin, 109*, 267-296.
- Maccoby, E. E. (1984). Middle childhood in the context of the family. In W. A. Collins (Ed.), *Development during middle childhood* (pp. 184-239). Washington, D.C.: National Academy Press.
- Maccoby, E. E., & Martin, J. A. (Eds.). (1983). *Socialization in the context of family: Parent-child interaction* (Vol. 4). New York: Wiley.
- MacDonald, A. P. (1971). Internal-external locus of control: Parental antecedents. *Journal of Consulting and Clinical Psychology, 37*, 141-147.
- Main, M. (1996). Introduction to the special section on attachment and psychopathology: Overview of the field of attachment. *Journal of Consulting and Clinical Psychology, 64*, 237-243.
- Main, M., Kaplan, N., & Cassidy, J. (1985). Security in infancy, childhood and adulthood: A move to the level of representation. *Growing Points of Attachment Theory Research: Monographs of the Society for Research in Child Development, 50*(1-2), Serial No. 209.
- Main, M., & Weston, D. R. (1981). The quality of the toddler's relationship to mother and to father: Related to conflict behaviour and the readiness to establish new relationships. *Child Development, 52*, 932-940.
- Manassis, K., & Bradley, S. J. (1994). The development of childhood anxiety disorders: Toward an integrated model. *Journal of Applied Developmental Psychology, 15*, 345-366.
- Markus, M. T., Lindhout, I. E., Boer, F., Hoogendijk, T. H. G., & Arrindell, W. A. (2003). Factors of perceived parental rearing styles: The EMBU-C examined in a sample of Dutch primary school children. *Personality and Individual Differences, 45*, 503-519.
- Marsh, H. W. (1989). Age and sex effects in multiple dimensions of self-concept: Preadolescence to early adulthood. *Journal of Educational Psychology, 81*, 417-430.
- Marsh, H. W., & MacDonald Holmes, I. W. (1990). Multidimensional self-concepts: validation of responses by children. *American Educational Research Journal, 27*, 89-117.
- Marsiglio, W., Amato, P., Day, R. D., & Lamb, M. E. (2000). Scholarship on fatherhood in the 1990s and beyond. *Journal of Marriage & Family, 62*, 1173-1192.
- Martin, N. G., Jardine, R., Andrews, G., & Heath, A. C. (1988). Anxiety disorders and neuroticism: Are there genetic factors specific to panic? *Acta Psychiatrica Scandinavica, 77*, 698-706.
- Marvin, R. S., & Britner, P. A. (1999). Normative development: The ontogeny of attachment. In J. Cassidy & P. R. Shaver (Eds.), *Handbook of attachment: Theory, research and clinical applications* (pp. 44-67). New York: Guilford Press.

- Masten, A. (2001). Ordinary magic: Resilience processes in development. *American Psychologist*, 56(3), 227-238.
- Masten, A., & Coatsworth, J. D. (1995). Competence, resilience and psychopathology. In D. Cicchetti & D. Cohen (Eds.), *Developmental psychopathology: Risk, disorder and adaptation* (Vol. 2, pp. 715-752). New York: Wiley.
- Masten, A., & Coatsworth, J. D. (1998). The development of competence in favourable and unfavourable environments: Lessons from successful children. *American Psychologist*, 53, 205-220.
- Masten, A., Coatsworth, J. D., Neemann, J., Gest, S. D., Tellegen, A., & Garmezy, N. (1995). The structure and coherence of competence from childhood through adolescence. *Child Development*, 66, 1635-1659.
- Masten, A. S., Hubbard, J. J., Gest, S. D., Tellegen, A., Garmezy, N., & Ramirez, M. (1999). Competence in the context of adversity: Pathways to resilience and maladaptation from childhood to late adolescence. *Development and Psychopathology*, 11, 143-169.
- Masten, A. S., Miliotis, D., Graham-Bermann, S. A., Ramirez, M., & Neemann, J. (1993). Children in homeless families: Risks to mental health and development. *Journal of Consulting and Clinical Psychology*, 61, 335-343.
- Matas, L., Arend, R., & Sroufe, L. A. (1978). Continuity of adaptation in the second year: The relationship between quality of attachment and later competence. *Child Development*, 49, 547-556.
- Mathews, A., Mogg, K., Kentish, J., & Eysenck, M. (1995). Effect of psychological treatment on cognitive bias in generalised anxiety disorder. *Behaviour Research and Therapy*, 33, 293-303.
- May, R. (1979). *The meaning of anxiety*. New York: Washington Square Press.
- McClure, E. B., Brennan, P. A., Hammen, C., & LeBrocq, R. M. (2001). Parental anxiety disorders, child anxiety disorders and the perceived parent-child relationship in an Australian high-risk sample. *Journal of Abnormal Child Psychology*, 29, 1-10.
- McCrae, R. R., & Costa, P. T. (1987). Validation of the five-factor model of personality across instruments and observers. *Journal of Personality and Social Psychology*, 52, 81-90.
- McFarlane, A. H., Bellissimo, A., & Norman, G. R. (1995). The role of family and peers in social self-efficacy: Links to depression in adolescence. *American Journal of Orthopsychiatry*, 65, 402-410.
- McGee, R., Feehan, M., Williams, S., Partridge, F., Silva, P., & Kelly, J. (1990). DSM-III disorders in a large sample of adolescents. *Journal of Child and Adolescent Psychiatry*, 29, 611-619.
- McGee, R., & Stanton, W. R. (1990). Parent reports of disability among 13 year olds with DSM-III disorder. *Journal of Child Psychology and Psychiatry*, 31, 793-801.
- McGuffin, P., & Katz, R. (1986). Nature, nurture and affective disorder. In J. W. F. Deakin (Ed.), *The biology of depression* (pp. 26-51). London: Gaskell Press.
- McLoyd, V. C. (1990). The impact of economic hardship on Black families and children: Psychological distress, parenting and socio-emotional development. *Child Development*, 61, 190-198.

- Meins, E. (1997). *Security of attachment and the social development of cognition*. Staffordshire University: Psychology Press.
- Messer, S. C., & Beidel, D. C. (1994). Psychosocial correlates of childhood anxiety disorders. *Journal of the American Academy of Child and Adolescent Psychiatry*, 33, 975-983.
- Messer, S. C., & Gross, A. M. (1995). Childhood depression and family interaction: A Naturalistic observation study. *Journal of Clinical Child Psychology*, 24(1), 77-88.
- Mikulincer, M., Florian, V., & Weller, A. (1993). Attachment styles, coping strategies and posttraumatic psychological distress: The impact of the Gulf War in Israel. *Journal of Personality and Social Psychology*, 64, 817-826.
- Miller, L. C. (1983). Fears and anxieties in children. In C. E. Walker & M. C. Roberts (Eds.), *Handbook of clinical child psychology*. New York: Wiley.
- Miller, L. C., Barrett, C. L., & Hampe, E. (1974). Phobias of childhood in a prescientific era. In A. Davids (Ed.), *Child personality and psychopathology: Current topics*. New York: Wiley.
- Miller, S. M. (1979). Controllability and human stress: Method, evidence and theory. *Behaviour Research and Theory*, 17, 287-304.
- Mills, R. S. L., & Rubin, K. H. (1998). Are behavioral control and psychological control both differentially associated with childhood aggression and social withdrawal? *Canadian Journal of Behavioural Sciences*, 30, 132-136.
- Mineka, S. (1985). Animal models of anxiety-based disorders: Their usefulness and limitations. In A. Tuma & J. D. Maser (Eds.), *Anxiety and the anxiety disorders* (pp. 199-224). Hillsdale, NJ: Erlbaum.
- Mineka, S., Davidson, M., Cook, M., & Keir, R. (1984). Observational conditioning of snake fear in rhesus monkeys. *Journal of Abnormal Psychology*, 93, 355-372.
- Mineka, S., Gunnar, M., & Champoux, M. (1986). Control and early socio-emotional development: Infant rhesus monkeys reared in controllable environments. *Child Development*, 57, 1241-1256.
- Mineka, S., & Kihlstrom, J. (1978). Unpredictable and uncontrollable events: A new perspective on experimental neurosis. *Journal of Abnormal Psychology*, 87(2), 256-271.
- Mineka, S., Watson, D., & Clark, L. A. (1998). Comorbidity of anxiety and unipolar mood disorders. *Annual Review of Psychology*, 49, 377-412.
- Mineka, S., & Zinbarg, R. (1996). Conditioning and ethological models of anxiety disorders: Stress-in-Dynamic-Context Anxiety models. In D. A. Hope (Ed.), *Nebraska symposium on motivation: Perspectives of anxiety, panic and fear. Current theory and research in motivation* (Vol. 43, pp. 135-210). Lincoln NE: University of Nebraska Press.
- Minuchin, S. (1974). *Families and family therapy*. Cambridge, MA: Harvard University Press.
- Minuchin, S., Rossman, B. L., & Baker, L. (1978). *Psychosomatic families*. Cambridge: Harvard University Press.
- Miserandino, M. (1996). Children who do well in school: Individual differences in perceived competence and autonomy in above average children. *Journal of Educational Psychology*, 88, 203-214.
- Mogg, K., Bradley, B. P., & Williams, R. (1995). Attentional bias in anxiety and depression: the role of awareness. *British Journal of Clinical Psychology*, 43, 17-36.

- Mogg, K., Bradley, B. P., Williams, R., & Mathews, A. (1993). Subliminal processing of emotional information in anxiety and depression. *Journal of Abnormal Psychology, 102*, 304-311.
- Moos, R. H., & Moos, B. S. (1981). *Family Environment Scale Manual*. Palo Alto, CA: Consulting Psychologists Press.
- Morris, A. S., Steinberg, L., Sessa, F. M., Avenevoli, S., Silk, J. S., & Essex, M. J. (2002). Measuring children's perceptions of psychological control: developmental and conceptual considerations. In B. K. Barber (Ed.), *Intrusive parenting: How psychological control affects children and adolescents* (pp. 125-159). Washington, D.C.: American Psychological Association.
- Morris, R. J., & Kratochwill, T. R. (1983). *Treating children's fears and phobias: A behavioral approach*. New York: Pergamon Press.
- Mulaik, S. A., James, L. R., Van Alstine, J., Bennett, N., Lind, S., & Stilwell, C. D. (1989). An evaluation of goodness of fit indices for structural equation models. *Psychological Bulletin, 103*, 430-455.
- Muris, P., Mayer, B., & Meesters, C. (2000). Self-reported attachment style, anxiety and depression in children. *Social Behavior and Personality, 28*(2), 157-162.
- Muris, P., Schouten, E., Meesters, C. & Gijsbers, J. (2003). Contingency-Competence-Control-related beliefs and symptoms of anxiety and depression in a young adolescent sample, *Child Psychiatry and Human Development, 33*(4), 325-339.
- Muris, P., Steerneman, P., Merckelbach, H., & Meesters, C. (1996). The role of parental fearfulness and modelling in children's fear. *Behavior Research and Theory, 34*(3), 265-268.
- Nachmias, M., Gunnar, M., Mangelsdorf, S., Parritz, R. H., & Buss, K. (1996). Behavioral inhibition and stress reactivity: The moderating role of attachment security. *Child Development, 67*(508-522).
- Neal, J. A., & Edelmann, R. J. (2003). The aetiology of social phobia: Toward a developmental profile. *Clinical Psychology Review, 23*, 761-786.
- Nelson, C. A. (2000). Neural plasticity and human development: The role of early experience sculpting memory systems. *Developmental Science, 3*, 115-130.
- Nelson, C. A., & Luciana, M. (2001). *Handbook of developmental cognitive neuroscience*. Cambridge, MA.: MIT Press.
- Neshat-Doost, H.T., Moradi, A.R., Taghavi, M.R., Yule, W. & Dalgleish, T. (1997). The performance of clinically depressed children and adolescents on the modified Stroop paradigm. *Personality and Individual Differences, 23*, 753-759.
- Neshat-Doost, H.T., Taghavi, M.R., Moradi, A.R., Yule, W. & Dalgleish, T. (1998). Memory for emotional trait adjectives in clinically depressed youth. *Journal of Abnormal Psychology, 107*, 642-650.
- Nezu, A. M., Nezu, C. M., Saraudarian, L., Kalmar, K., & Rosan, G. F. (1986). Social problem solving as a moderating variable between negative life stress and depressive symptoms. *Cognitive Therapy and Research, 10*, 489-498.
- Nicholls, J. G. (1979). Development of perception of own attainment and causal attributions for success and failure in reading. *Journal of Educational Psychology, 71*, 94-99.

- Nilzon, K. R., & Palmerus, K. (1997). The influence of familial factors on anxiety and depression in childhood and early adolescence. *Adolescence, 32*, 935-943.
- Nolen-Hoeksema, S., Girgus, J. S., & Seligman, M. E. P. (1986). Learned helplessness in children: A longitudinal study of depression, achievement and attributional style. *Journal of Personality and Social Psychology, 51*, 435-442.
- Nolen-Hoeksema, S., Girgus, J. S., & Seligman, M. E. P. (1992). Predictors and consequences of childhood depressive symptoms: A 5-year longitudinal study. *Journal of Abnormal Psychology, 101*, 405-422.
- Nolen-Hoeksema, S., Wolfson, A., Mumme, D., & Guskin, K. (1995). Helplessness in children of depressed and nondepressed mothers. *Developmental Psychology, 31*, 377-387.
- Norvell, N., Brophy, C., & Finch, A. J. (1985). The relationship of anxiety to childhood depression. *Journal of Personality Assessment, 49*, 150-153.
- Nowicki, S., & Schneewind, K. A. (1982). Relation of family climate variables to locus of control in German and American students. *Journal of Genetic Psychology, 141*, 277-286.
- Nowicki, S., & Segal, W. (1974). Perceived parental characteristics, locus of control orientation and behavioral correlates of locus of control. *Developmental Psychology, 10*, 33-37.
- Nowicki, S., & Strickland, B. R. (1973). A locus of control scale for children. *Journal of Consulting and Clinical Psychology, 40*, 148-154.
- Nugent, K., & Mineka, S. (1994). The effects of high and low trait anxiety on implicit and explicit memory tasks. *Cognition and Emotion, 8*, 147-163.
- Nunn, G. D. (1988). Concurrent validity between the Norwicki-Strickland Locus of Control Scale and the State-Trait Anxiety Inventory for Children. *Educational and Psychological Measurement, 48*, 435-438.
- O'Brien, M., Margolin, G., & John, R. S. (1995). Relations among marital conflict, child coping and child adjustment. *Journal of Clinical Child Psychology, 24*, 346-361.
- O'Connor, T. G., Hetherington, E. M., Reiss, D., & Plomin, R. (1995). A twin-sibling study of observed parent-adolescent interactions. *Child Development, 66*, 812-829.
- Offer, D., Howard, K. L., Schonert, K. A., & Ostrov, E. (1991). To whom do adolescents turn for help? Differences between disturbed and nondisturbed adolescents. *Journal of the American Academy of Child and Adolescent Psychiatry, 30*, 623-630.
- Ognibene, T. C., & Collins, N. L. (1998). Adult attachment styles, perceived social support and coping strategies. *Journal of Social and Personal Relations, 15*, 323-345.
- Oliver, J. M., & Paull, J. C. (1995). Self-esteem and self-efficacy: Perceived parenting and family climate; and depression in university students. *Journal of Clinical Psychology, 51*, 467-481.
- Ollendick, R. H., & Hersen, M. (1998). *Handbook of child psychopathology*. New York: Plenum.
- Ollendick, R. H., & King, N. J. (1994). Diagnosis, assessment and treatment of internalising problems in children: The role of longitudinal data. *Journal of Consulting and Clinical Psychology, 62*, 918-927.
- Ollendick, R. H., Matson, J. L., & Helsel, W. J. (1985). Fears in children and adolescents: Normative data. *Behaviour Research and Therapy, 23*, 465-467.

- Ollendick, R. H., Yang, B., King, N. J., Dong, Q., & Akande, A. (1996). Fears in American, Australian, Chinese and Nigerian children and adolescents: A cross-cultural study. *Journal of Child Psychology & Psychiatry*, 37, 213-220.
- Ollendick, R. H., Yule, W., & Ollier, K. (1991). Fears in British children and their relationship to manifest anxiety and depression. *Journal of Child Psychology and Psychiatry*, 32, 321-331.
- Olsen, S. F., Yang, C., Hart, C. H., Robinson, C. C., Wu, P., Nelson, D. A., Nelson, L. J., Nelson, S. J., & Wo, J. (2002). Maternal psychological control and preschool children's behavioural outcomes in China, Russia and the United States. In B. K. Barber (Ed.), *Intrusive parenting: How psychological control affects children and adolescents* (Vol. 235-262). Washington, DC: American Psychological Association.
- Olson, D. H., Bell, R., & Portner, J. (1978). *FACES item booklet*. St. Paul MN: Family Social Science, University of Minnesota.
- Olson, D. H., Russell, C. A., & Sprenkle, D. H. (1979). Circumplex model of marital and family systems!: Cohesion and adaptability dimensions, family types and clinical applications. *Family Process*, 18, 3-28.
- Orvaschel, H., Lewinsohn, P. M., & Seeley, J. R. (1995). Continuity of psychopathology in community sample of adolescents. *Journal of the American Academy of Child and Adolescent Psychiatry*, 34(11), 1525-1535.
- Page, A. E. (1979). *Mothers and infants: Early interaction and consequences*. Unpublished doctoral dissertation, Massey University, Palmerston North, New Zealand.
- Papini, D. R., & Roggman, L. A. (1992). Adolescent perceived attachment to parents in relation to competence, depression and anxiety: A longitudinal study. *Journal of Early Adolescence*, 12(4), 420-440.
- Parker, G. (1979a). Parental characteristics in relation to depressive disorders. *British Journal of Psychiatry*, 134, 138-147.
- Parker, G. (1979b). Parental deprivation and depression in a non-clinical group. *Australian and New Zealand Journal of Psychiatry*, 13, 51-56.
- Parker, G. (1979c). Reported parental characteristics in relation to trait depression and anxiety levels in a non-clinical group. *Australian and New Zealand Journal of Psychiatry*, 13, 260-264.
- Parker, G. (1981). Parental representation of patients with anxiety neurosis. *Acta Psychiatrica Scandinavica*, 63, 33-36.
- Parker, G., Tulpin, H., & Brown, L. B. (1979). A parent bonding instrument. *British Journal of Medical Psychology*, 52, 1-11.
- Patterson, G. R. (1982). *Coercive family process*. Eugene, OR: Castalia Press.
- Perry, B. D., Potland, R. A., Blakley, T. L., Beker, W. L., & Vigilante, D. (1995). Childhood trauma, the neurobiology of adaptation and "use dependent" development of the brain: How "states" become "traits". *Infant Mental Health Journal*, 16, 271-289.
- Persons, J., Burns, D., Perloff, J., & Miranda, J. (1993). Relationships between symptoms of depression and anxiety and dysfunctional beliefs about achievement and attachment. *Journal of Abnormal Psychology*, 102, 518-524.

- Peterson, C., Maier, S. F., & Seligman, M. E. P. (1993). *Learned helplessness: A theory for the age of personal control*. New York: Oxford University Press.
- Peterson, G. W., & Hann, D. (1999). Socializing parents and children in families. In S. Steinmetz & M. Sussman & G. W. Peterson (Eds.), *Handbook of marriage and the family* (Rev. ed., pp. 327-270). New York: Plenum Press.
- Pettit, G. S., & Laird, R. D. (2002). Psychological control and monitoring in early adolescence: The role of parental involvement and earlier child adjustment. In B. K. Barber (Ed.), *Intrusive parenting: How psychological control affects children and adolescents*. Washington, DC: American Psychological Association.
- Pettit, G. S., Laird, R. D., Dodge, K. A., Bates, J. E., & Criss, M. M. (2001). Antecedents and behavior-problem outcomes of parental monitoring and psychological control. *Child Development*, 72, 583-598.
- Phillips, D. A. (1984). The illusion of incompetence among academically competent children. *Child Development*, 58, 2000-2016.
- Phillips, D. A. (1987). Socialisation of perceived academic competence among highly competent children. *Child Development*, 58, 1308-1320.
- Phillips, D. A., & Zimmerman, M. (1990). The developmental course of perceived competence and incompetence among competent children. In R. J. Sternberg & J. Kolligian, J. (Eds.), *Competence considered* (pp. 41-66). New Haven, CT: Yale University Press.
- Piaget, J. (1954). *The Construction of Reality in the Child*. New York: Basic Books.
- Piantas, R. C., Marvin, R. S., Britner, P. A., & Borowitz, K. (1996). Mothers' resolution of their children's diagnoses: Organized patterns of caregiving representations. *Infant Mental Health Journal*, 17, 239-256.
- Pike, A., Mc Guire, S., Hetherington, E. M., Reiss, D., & Plomin, R. (1996). Family environment and adolescent depressive symptoms and antisocial behaviour: A multivariate genetic analysis. *Developmental Psychology*, 32, 590-603.
- Plomin, R. (1994). *Genetics and experience: The developmental interplay between nature and nurture*. Newbury Park, CA: Sage.
- Plomin, R., & Caspi, A. (1999). Behavioral Genetics and Personality. In L. A. Pervin & O. P. Johns (Eds.), *Handbook of personality: theory and research* (2 ed., pp. 251-276). New York: Guilford Press.
- Plomin, R., & Daniels, D. (1985). Origins of individual differences in infant shyness, *Developmental Psychology*, 21, 118-121.
- Plomin, R., Pederson, N. L., McClearn, G. E., Nesselroade, J. R., & Bergeman, C. S. (1988). EAS temperaments during the last half of the life span: Twins reared apart and twins reared together. *Psychology and Aging*, 3, 43-50.
- Precht, H. F. R. (1997). The importance of fetal movements. In K. J. Connolly & H. Forssberg (Eds.), *Neurophysiology and neuropsychology of motor development*. Cambridge: Mac Keith Press.
- Priel, B., & Shamai, D. (1995). Attachment style and perceived social support: Effects of affect regulation. *Personality and Individual Differences*, 19(2), 235-241.
- Prior, M. (1992). Childhood temperament. *Journal of Child Psychology & Psychiatry*, 33, 249-279.

- Pryce, C. R. (1995). Determinants of motherhood in human and nonhuman primates: A biopsychosocial model. In C. R. Pryce & R. D. Martin & D. Skuse (Eds.), *Motherhood in human and nonhuman primates* (pp. 1-15). Basel: Karger.
- Puig-Antich, J., Lukens, E., Davies, M., Goetz, D., Brennan-Quattrock, J., & Todak, G. (1985). Psychosocial functioning in prepubertal major depressive disorders: Interpersonal relationships during the depressive episode. *Archives of General Psychiatry*, 42, 500-507.
- Rachman, S. J. (1991). Neoconditioning and the classical theory of fear acquisition. *Clinical Psychology Review*, 11, 155-173.
- Rapee, R. M. (1991). Generalised anxiety disorder: A review of clinical features and theoretical concepts. *Clinical Psychology Review*, 11, 419-440.
- Rapee, R. M. (1997). Potential role of childrearing practices in the development of anxiety and depression. *Clinical Psychology Review*, 17, 47-67.
- Rapee, R. M. (2000). Group treatment of children with anxiety disorders; outcomes and predictors of treatment response. *Australian Journal of Psychology*, 52(3), 125-130.
- Rapee, R. M. (2001). The development of generalised anxiety. In M. W. Vasey & M. R. Dadds (Eds.), *The developmental psychopathology of anxiety* (pp. 481-504). New York: Oxford University Press.
- Rapee, R. M., Craske, M. G., Brown, T., & Barlow, D. H. (1996). Measurement of perceived control over anxiety related events. *Behavior Therapy*, 27, 279-293.
- Ray, J. C., & Sapolsky, R. M. (1992). Styles of male social behavior and their endocrine correlates among high-ranking wild baboons. *American Journal of Primatology*, 28, 231-250.
- Reid, M., Landesman, S., Treder, R., & Jaccard, J. (1989). "My family and friends": Six- to twelve- year-old children's perceptions of social support. *Child Development*, 60, 896-910.
- Reiss, D., Hetherington, E. M., Plomin, R., Howe, G. W., Simmens, S. J., Henderson, S. H., O'Connor, T. G., Bussell, D. A., Anderson, E. R., & Law, T. (1995). Genetic questions for environmental studies: Differential parenting and psychopathology in adolescence. *Archives of General Psychiatry*, 52, 925-936.
- Rende, R. D. (1993). Longitudinal relations between temperament traits and behavioral syndromes in middle childhood. *Journal of the American Academy of Child and Adolescent Psychiatry*, 32, 287-290.
- Renson, G. J., & Schaefer, E. S. (1968). Cross-national validity of a spherical conceptual model for parent behaviour. *Child Development*, 39, 1229-1235.
- Reynolds, C., & Richmond, B. (1985). *Manual for the Revised Children's Manifest Anxiety Scale*. Los Angeles: Western Psychological Services.
- Reynolds, C., & Richmond, B. (2000). *Prepublication edition of the Adult Manifest Anxiety Scale (AMAS)*. Los Angeles: Western Psychology Press.
- Reynolds, C. R., & Paget, K. D. (1983). National normative and reliability data for the revised children's manifest anxiety scale. *School Psychology Review*, 12(3), 324-336.
- Ricciuti, A. E. (1993). *Child-mother attachment: A twin study*. Unpublished PhD, Dissertation Abstracts International.

- Rickman, M. D., & Davidson, R. J. (1994). Personality and behavior in parents of temperamentally inhibited and uninhibited children. *Developmental Psychology, 30*, 346-354.
- Robinson, J. L., Kagan, J., Reznick, J. S., & Corley, R. (1992). The heritability of inhibited and uninhibited behaviour: A twin study. *Developmental Psychology, 28*, 1030-1037.
- Ronan, K. R. (1996). Building a reasonable bridge in childhood anxiety assessment: A practitioner's resource guide. *Cognitive and Behavioural Practice, 3*, 63-90.
- Ronan, K. R., & Deane, F. P. (1998). Anxiety disorders. In P. Graham (Ed.), *Cognitive behavioural therapy for children and families: Cambridge monograph series in child and adolescent psychiatry*. (pp. 74-94). Cambridge: Cambridge University Press.
- Ronan, K. R., & Kendall, P. C. (1997). Self-talk in distressed youth: States-of-mind and content specificity. *Journal of Clinical Child Psychology, 26*, 330-337.
- Ronan, K. R., Kendall, P. C., & Rowe, M. (1994). Negative affectivity in children: Development and validation of a self-statement questionnaire. *Cognitive Therapy and Research, 18*(6), 509-528.
- Rosenbaum, J. F., Biederman, J., Hirshfeld, D. R., Bolduc, E. A., & Chaloff, J. (1991). Behavioral inhibition in children: A possible precursor to panic disorder and social phobia. *Journal of Clinical Psychiatry, 52*, 5-9.
- Rosenberg, M. (1990). Control of environment and control of self. In J. Rodin & C. Schooler & K. W. Schale (Eds.), *Self-Directedness: Cause and effects throughout the life course* (pp. 147-154). Hillsdale, NJ: Erlbaum.
- Rosenstein, D. S., & Horowitz, H. A. (1996). Adolescent attachment and psychopathology. *Journal of Consulting and Clinical Psychology, 64*(2), 244-253.
- Rothbart, M. K. (1986). Longitudinal observation of infant temperament. *Developmental Psychology, 22*, 356-365.
- Rothbart, M. K. (1989). Temperament and development. In G. A. Kohnstamm & J. E. Bates & M. K. Rothbart (Eds.), *Temperament in childhood* (pp. 187-247). New York: Wiley.
- Rothbart, M. K., & Bates, J. E. (1998). Temperament. In N. Eisenberg (Ed.), *Social, emotional and personality development* (5 ed., Vol. 3, pp. 105-176). New York: Wiley.
- Rothbart, M. K., Posner, M. I., & Hershey, K. L. (1995). Temperament, attention and developmental psychopathology. In D. Cicchetti & D. Cohen (Eds.), *Developmental psychopathology: Theory and methods* (Vol. 1, pp. 315-340). New York: Wiley.
- Rothbaum, F., Weisz, J. R., & Snyder, S. S. (1982). Changing the world and changing the self: A two-process model of perceived control. *Journal of Personality and Social Psychology, 42*, 5-37.
- Rotter, J. B. (1966). Generalised expectancies for internal versus external control of reinforcement. *Psychological Monographs, 80*(1 Whole No. 609).
- Rotter, J. B. (1975). Some problems and misconceptions related to the construct of internal versus external control of reinforcement. *Journal of Consulting and Clinical Psychology, 43*, 56-67.
- Rowe, D. C., & Plomin, R. (1977). Temperament in early childhood. *Journal of Personality Assessment, 41*, 150-156.

- Rubin, K. H., & Burgess, K. B. (2001). Social withdrawal and anxiety. In M. W. Vasey & M. R. Dadds (Eds.), *The developmental psychopathology of anxiety* (pp. 407-434). New York: Oxford University Press.
- Rubin, K. H., & Mills, R. S. L. (1988). The many faces of social isolation in childhood. *Journal of Consulting and Clinical Psychology, 56*, 916-924.
- Rubin, K. H., & Mills, R. S. L. (1991). Conceptualizing developmental pathways to internalising disorders in childhood. *Canadian Journal of Behavioural Science, 23*, 300-317.
- Ruble, D. N. (1983). The development of social comparison processes and their role in achievement-related self-socialization. In E. G. Higgins & D. N. Ruble & W. W. Hartup (Eds.), *Social cognition and social development: A sociocultural perspective* (pp. 134-157). Cambridge: Cambridge University Press.
- Rutter, M. (1985). Resilience in the face of adversity: protective factors and resistance to psychiatric disorder. *British Journal of Psychiatry, 147*, 598-611.
- Rutter, M. (1987). Psychosocial resilience and protective mechanisms. *American Journal of Orthopsychiatry, 57*, 316-329.
- Sagi, A., van IJzendoorn, M. H., & Koren-Karie, N. (1991). Primary appraisal of the Strange Situation. *Developmental Psychology, 27*, 587-596.
- Sameroff, A. J. (1995). General systems theories and developmental psychopathology. *Developmental Psychopathology, 1*, 659-695.
- Sameroff, A. J., Seifer, R., & Zax, M. (1982). Early development of children at risk for emotional disorder. *Monographs of the Society for Research in Child Development, 47*(7, Serial No. 199).
- Sanders, M. R., & Dadds, M. R. (1993). *Behavioural family intervention*. New York: Longwood.
- Sanderson, W. C., DiNardo, P. A., Rapee, R. M., & Barlow, D. H. (1990). Syndrome co-morbidity in patients diagnoses with a DSM-III-Revised anxiety disorder. *Journal of Abnormal Psychology, 99*, 308-312.
- Sanderson, W. C., Rapee, R. M., & Barlow, D. H. (1989). The influence of an illusion of control on panic attacks induced via inhalation of 5.5% carbon dioxide-enriched air. *Archives of General Psychiatry, 46*, 157-164.
- Sandler, I., Wolchik, S., Braver, S., & Fogas, B. (1991). Stability and quality of life events and psychological symptomatology in children of divorce. *American Journal of Community Psychology, 19*, 501-520.
- Sapolsky, R. M. (1989). Hypercortisolism among socially subordinate wild baboons originates at the CNS level. *Archives of General Psychiatry, 46*, 1047-1051.
- Sapolsky, R. M., Alberts, S. C., & Altman, J. (1997). Hypercortisolism associated with socially subordination or social isolation among wild baboons. *Archives of General Psychiatry, 54*, 1137-1143.
- Satir, V. (1967). *Conjoint Family therapy: A guide to theory and technique*. Palo Alto, CA: Science & Behaviour Books Inc.
- Saudino, K. J., McGuire, S., Hethington, E. M., Reiss, D., & Plomin, R. (1995). Parent Ratings of EAS Temperaments in Twins, Full Siblings, Half Siblings and Step Siblings. *Journal of Personality and Social Psychology, 68*(4), 723-733.

- Schaefer, E. S. (1959). The circumplex model of maternal behaviour. *Journal of Abnormal and Social Psychology, 59*, 226-235.
- Schaefer, E. S. (1965). Children's reports of parental behaviour: An inventory. *Child Development, 36*, 413-424.
- Schaefer, E. S. (1965b). A configurational analysis of children's reports of parent behavior. *Journal of Consulting Psychology, 29*, 552-557.
- Schludermann, E. D., & Schludermann, S. (1970). Replicability of factors in children's report of parent behaviour (CRPBI). *Journal of Psychology, 76*, 239-249.
- Schmidt, L. A., Fox, N. A., Rubin, K. H., Sternberg, E. M., Gold, P. W., Smith, C. C., & Schulkin, J. (1997). Behavioral and neuroendocrine responses in shy children. *Developmental Psychobiology, 30*, 127-140.
- Schneewind, K. A. (1989). Contextual approaches to family systems research: The macro-micro puzzle. In K. Kreppner & R. M. Lerner (Eds.), *Family systems and life span development* (pp. 197-221). Hillsdale, NJ: Erlbaum.
- Schneewind, K. A. (1995). Impact of family processes on control beliefs. In A. Bandura (Ed.), *Self-efficacy in changing societies*. New York: Cambridge University Press.
- Schumacker, R. E., & Lomax, R. G. (1996). *A beginner's guide to structural equation modelling*. Mahwah, New Jersey: Erlbaum Associates.
- Schwartz, J. C., Barton-Henry, M. L., & Pruzinsky, T. (1985). Assessing child-rearing behaviours: A comparison of ratings made by mother, father, child and sibling on the CRPBI. *Child Development, 56*(462-479).
- Seifer, R., Schiller, M., Sameroff, A. J., Resnick, S., & Riordan, K. (1996). Attachment, maternal sensitivity, and infant temperament during the first year of life. *Developmental Psychology, 32*, 12-25.
- Seligman, M. E. P. (1975). *Helplessness*. San Francisco: Freeman.
- Seligman, M. E. P. (1991). *Learned optimism*. New York: Knopf.
- Selvini-Palazzoli, M., Boscolo, L., Cecchin, G., & Prata, G. (1978). *Paradox and counterparadox*. New York: Jason Aronson.
- Seroczynski, A. D., Cole, D. A., & Maxwell, S. E. (1997). Cumulative and compensatory effects of competence and incompetence on depressive symptoms in children. *Journal of Abnormal Psychology, 106*(4), 586-597.
- Shapiro, D. H., Schwartz, C. E., & Astin, J. A. (1996). Controlling ourselves, controlling our world: Psychology's role in understanding positive and negative consequences of seeking and gaining control. *American Psychologist, 51*(12), 1213-1230.
- Shean, G., & Lease, C. (1991). The relationship between interaction patterns and agoraphobic fears among college students. *Journal of Psychology, 125*, 271-278.
- Shear, M. K. (1991). The concept of uncontrollability. *Psychological Inquiry, 2*(1), 88-93.
- Sheeber, L., Hops, H., Alpert, A., Davis, B., & Andrews, J. (1997). Family support and conflict: Prospective relations to adolescent depression. *Journal of Abnormal Child Psychology, 25*(4), 333-344.
- Sheeber, L., & Sorenson, E. (1998). Family relationships of depressed adolescents: A multimethod assessment. *Journal of Clinical Child Psychology, 27*(3), 268-277.

- Shortt, A. L., Barrett, P. M., Dadds, M. R., & Fox, T. L. (2001). The influence of family and experimental context on cognition in anxious children. *Journal of Abnormal Child Psychology*, 29, 385-396.
- Siegelman, M. (1965). College student personality correlates of early parent-child relationships. *Journal of Consulting Psychology*, 29, 558-564.
- Silove, D., Parker, G., Hadzi-Pavlovic, D., Manicavasagar, V., & Blaszyvynski, A. (1991). Parental representations of patients with panic disorders and general anxiety disorder. *British Journal of Psychiatry*, 159, 835-841.
- Silverman, W. K., La Greca, A. M., & Wasserstein, S. B. (1995). What do children worry about?: Worries and their relation to anxiety. *Child Development*, 66, 671-686.
- Silverman, W. K., & Weems, C. F. (1999). Anxiety sensitivity in children. In S. Taylor (Ed.), *Anxiety sensitivity: Theory, research and treatment of the fear of anxiety* (pp. 239-268). London: Erlbaum.
- Simeonsson, R. (1994). *Risk, resilience and prevention*. Sydney: Brookes.
- Simpson, J. A., Rholes, W. S., & Nelligan, J. S. (1992). Support seeking and support giving within couples in an anxiety-provoking situation: The role of attachment styles. *Journal of Personality and Social Psychology*, 62, 434-446.
- Siqueland, L., Kendall, P. C., & Steinberg, L. (1996). Anxiety in children: Perceived family environment and observed family interaction. *Journal of Clinical Child Psychology*, 25, 225-237.
- Skinner, E. (1991). Development and perceived control: A dynamic model of action in context. In M. Gunnar & L. A. Sroufe (Eds.), *Self processes and development: The Minnesota Symposia on Child Development* (Vol. 23, pp. 167-216). Hillsdale: Erlbaum.
- Skinner, E. A. (1996). A guide to constructs of control. *Journal of Personality and Social Psychology*, 71, 549-570.
- Skinner, E. A., Chapman, M., & Baltes, P. B. (1988). Control, means-ends, and agency beliefs: A new conceptualisation and its measurement during childhood. *Journal of Personality and Social Psychology*, 54, 117-133.
- Skinner, E. A., Zimmer-Gembeck, M. J., & Connell, J. P. (1998). Individual differences and the development of perceived control. *Monographs of the Society for Research in Child Development*, 63( 2-3).
- Skinner, H. A., Steinhauer, P. D., & Santa-Barbara, J. (1983). The Family Assessment Measure. *Canadian Journal of Community Mental Health*, 2, 91-105.
- Smets, A. C., & Hartup, W. W. (1988). Systems and symptoms: Family cohesion, adaptability and childhood behaviour problems. *Journal of Abnormal Child Psychology*, 16, 233-246.
- Smucker, M. R., Craighead, W. E., Craighead, L. W., & Green, B. J. (1986). Normative and reliability data for the Children's Depression Inventory. *Journal of Abnormal Child Psychology*, 14, 25-40.
- Solomon, J., & George, C. (1999). The measurement of attachment security in infancy and childhood. In J. Cassidy & P. R. Shaver (Eds.), *Handbook of attachment: Theory, research and clinical applications* (pp. 287-316). New York: Guilford Press.

- Southam-Gerow, M. A., & Kendall, P. C. (2000). A preliminary study of the emotion understanding of youth referred for treatment of anxiety disorders. *Journal of Clinical Child Psychology, 29*, 319-327.
- Spangler, G., & Grossman, K. E. (1993). Biobehavioural organisation in securely and insecurely attached infants. *Child Development, 64*, 1439-1450.
- Spence, S. H. (1997). Structure of anxiety symptoms among children: A confirmatory factor-analytic study. *Journal of Abnormal Psychology, 106*, 280-297.
- Spence, S. H., Donovan, C. & Brechman-Toussaint, M. (1999). Social skills, social outcomes and cognitive features of childhood social phobia. *Journal of Abnormal Psychology, 108*, 211-221.
- Spence, S. H., Rapee, R. M., McDonald, C., & Ingram, M. (2001). The structure of anxiety symptoms among preschoolers. *Behaviour Research and Therapy, 39*, 1293-1316.
- Spieker, S. J., & Bensley, L. (1994). Roles of living arrangement and grandmother social support in adolescent mothering and infant attachment. *Developmental Psychology, 30*, 102-111.
- Sroufe, L. A. (1985). Attachment classification from the perspective of infant-caregiver relationships and infant temperament. *Child Development, 56*, 1-14.
- Sroufe, L. A. (1990). Considering the normal and the abnormal together: The essence of developmental psychopathology. *Development and Psychopathology, 2*(335-347).
- Sroufe, L. A., Egeland, B., & Kreutzer, T. (1990). The fate of early experience following developmental change: Longitudinal approaches to individual adaptation in childhood. *Child Development, 61*, 1363-1373.
- Sroufe, L. A., & Fleeson, J. (1986). Attachment and the construction of relationships. In W. W. Hartup & Z. Rubin (Eds.), *Relationships and development* (pp. 57-71). Hillsdale, NJ: Erlbaum.
- Sroufe, L. A., Fox, N. A., & Pancake, V. (1983). Attachment and dependency in developmental perspective. *Child Development, 54*, 1615-1627.
- Stams, G. J. J. M., Juffer, F., & van IJzendoorn, M. H. (2002). Maternal sensitivity, infant attachment and temperament in early childhood predict adjustment in middle childhood: The case of adopted children and their biologically unrelated parents. *Developmental Psychology, 38*, 806-822.
- Stark, K. D., Humphrey, L. L., Crook, K., & Lewis, K. (1990). Perceived family environments of depressed and anxious children: Child's and maternal figure's perspectives. *Journal of Abnormal Child Psychology, 18*, 527-547.
- Stark, K. D., Humphrey, L. L., Laurent, J., Livingston, R., & Christopher, J. (1993). Cognitive, behavioural and family factors in the differentiation of depressive and anxiety disorders during childhood. *Journal of Consulting and Clinical Psychology, 61*, 878-886.
- Stark, K. D., & Laurent, J. (2001). Joint factor analysis of the Children's Depression Inventory and the Revised Children's Manifest Anxiety Scale. *Journal of Clinical Child Psychology, 30*, 552-567.
- Stark, K. D., Schmidt, K. L., & Joiner Jr., T. E. (1996). Cognitive triad: relationship to depressive symptoms, parents' cognitive triad and perceived parental messages. *Journal of Abnormal Child Psychology, 24*(5), 615-632.

- Steele, R. G., Tripp, G., Kotchick, B. A., Summers, P., & Forehand, R. (1997). Family members' uncertainty about parental chronic illness: The relationship of haemophilia and HIV infection to child functioning. *Journal of Paediatric Psychology*, 22, 577-591.
- Steer, R. A., Beck, A. T., Clark, D. A., & Ranieri, W. F. (1995). Common and specific dimensions of self-reported anxiety and depression: A replication. *Journal of Abnormal Psychology*, 104, 542-545.
- Steiger, J. H. (1990). Structural model evaluation and modification: An interval estimation approach. *Multivariate behavioral research*, 25, 173-180.
- Steinberg, L. (1990). Autonomy, conflict and harmony in the family relationship. In S. S. Feldman & G. R. Elliott (Eds.), *At the threshold: The developing adolescent* (pp. 255-176). Cambridge, MA: Harvard University Press.
- Steinberg, L., & Avenevoli, S. (2000). The role of context in the development of psychopathology: A conceptual framework and some speculative propositions. *Child Development*, 71, 66-74.
- Steinberg, L., Lamborn, S. D., Dornbusch, S. M., & Darling, N. (1992). Impact of parenting practices on adolescent achievement: Authoritative parenting, school involvement and encouragement to succeed. *Child Development*, 63, 1266-1281.
- Steinberg, L., Mounts, N. S., Lamborn, S. D., & Dornbusch, S. M. (1991). Authoritative parenting and adolescent adjustment across varied ecological niches. *Journal of Research on Adolescence*, 1, 19-36.
- Stemberger, R. T., Turner, S. M., Beidel, D. C., & Calhoun, K. S. (1995). Social phobia: An analysis of possible developmental factors. *Journal of Abnormal Psychology*, 104, 526-531.
- Stevenson, J., Batten, N., & Cherner, M. (1992). Fears and fearfulness in children and adolescents: A genetic analysis of twin data. *Journal of Child Psychology & Psychiatry*, 33, 977-985.
- Stipek, D. J., & Mac Iver, D. (1989). Developmental change in children's assessment of intellectual competence. *Child Development*, 60, 521-538.
- Strauss, C. C. (1990). Overanxious disorder in childhood. In M. Hersen & C. G. Last (Eds.), *Handbook of child and adult psychopathology: A longitudinal perspective* (pp. 237-246). New York: Pergamon Press.
- Strauss, C. C., & Francis, G. (1989). Phobic disorders. In C. G. Last & M. Hersen (Eds.), *Handbook of child psychiatric diagnosis* (pp. 170-190). New York: Wiley.
- Strauss, C. C., Last, C. G., Hersen, M., & Kazdin, A. E. (1988). Association between anxiety and depression in children and adolescents with anxiety disorders. *Journal of Abnormal Child Psychology*, 16, 57-68.
- Sulloway, F. J. (1996). *Born to rebel: Family conflict and radical genius*. New York: Pantheon.
- Suomi, S. J. (1999). Attachment in rhesus monkeys. In J. Cassidy & P. R. Shaver (Eds.), *Handbook of attachment: Theory, research and clinical application*. New York: Guilford.
- Suomi, S. J. (2000). A biobehavioral perspective on developmental psychopathology. In A. J. Sameroff & M. Lewis & S. M. Miller (Eds.), *Handbook in developmental psychopathology*. New York: Kluwer Academic/Plenum.

- Tabachnick, B. G., & Fidell, L. S. (2001). *Using multivariate statistics* (4 ed.). Boston: Allyn and Bacon.
- Tellegen, A. (1985). Structures of mood and personality and their relevance to assessing anxiety, with an emphasis on self-report. In A. Tuma & J. D. Maser (Eds.), *Anxiety and the anxiety disorders*. Hillsdale, NJ: Erlbaum.
- Teti, D., Wolfe, V. V., Sakin, J., Kucera, E., & Corns, K. (1996). And baby makes four: Predictors of attachment security among preschool-age first borns during the transition to siblinghood. *Child Development*, 67, 579-596.
- Texas, U. o. (2001). *SEM tutorial for AMOS*. University of Texas. Available: <http://www.utexas.edu/cc/stat/tutorials/amos/>.
- Thapar, A., & McGuffin, P. (1995). Are anxiety symptoms in childhood heritable? *Journal of Child Psychology & Psychiatry*, 36, 439-447.
- Thayer, J. F., Friedman, B. H., & Borkovec, T. D. (1996). Autonomic characteristics of generalised anxiety disorder and worry. *Biological Psychiatry*, 39, 255-266.
- Thomas, D. L., & Wilcox, J. E. (1987). The rise of family theory: An historical and critical analysis. In M. B. Sussman & S. K. Steinmetz (Eds.), *Handbook of marriage and the family* (pp. 81-102). New York: Plenum.
- Thompson, R. A. (1998). Early sociopersonality development. In N. Eisenberg (Ed.), *Handbook of child psychology* (5 ed., Vol. 3, pp. 25-104). New York: Wiley.
- Thompson, R. A. (1999). Early attachment and later development. In J. Cassidy & P. R. Shaver (Eds.), *Handbook of attachment* (pp. 265-286). New York: Guilford.
- Thompson, R. A. (2001). Childhood anxiety disorders from the perspective of emotion regulation and attachment. In M. W. Vasey & M. R. Dadds (Eds.), *The developmental psychopathology of anxiety* (pp. 160-182). New York: Oxford University Press.
- Thompson, S. C. (1981). Will it hurt less if I can control it? A complex answer to a simple question. *Psychological Bulletin*, 90, 89-101.
- Thurber, C., & Sigman, M. (1998). Preliminary models of risk and protective factors for childhood homesickness: Review and empirical synthesis. *Child Development*, 69 (4), 903-934.
- Thurber, C. A., & Sigman, M. D. (1999). Homesickness in preadolescent and adolescent girls: Risk factors, behavioural correlates and sequelae. *Journal of Clinical Child Psychology*, 28, 185-197.
- Thurber, C. A., & Weisz, J. R. (1997). "You can try or you can just give up": The impact of perceived control and coping style on childhood homesickness. *Developmental Psychology*, 33(3), 508-517.
- Troy, M., & Sroufe, L. A. (1987). Victimization among preschoolers: Role of attachment relationship history. *Journal of the American Academy of Child and Adolescent Psychiatry*, 26, 166-172.
- Turner, J. E., & Cole, D. A. (1994). Developmental differences in cognitive diatheses for child depression. *Journal of Abnormal Child Psychology*, 22, 15-32.
- Turner, P. J. (1993). Attachment to mother and behaviour with adults in preschool. *British Journal of Developmental Psychology*, 11, 75-89.

- Turner, S. M., Beidel, D. C., & Wolff, P. L. (1996). Is behaviour inhibition related to the anxiety disorders? *Clinical Psychology Review*, 16 (157-162).
- Ullman, J. B. (2001). Structural Equation Modelling. In B. G. Tabachnick & L. S. Fidell (Eds.), *Using multivariate statistics* (4th ed., pp. 653-771). Boston: Allyn and Bacon.
- unknown. (2002). *Mental Health: A report of the Surgeon General*, [internet]. Department of Surgeon General. Available: [www.surgeongeneral.gov/Library/](http://www.surgeongeneral.gov/Library/) [2002, June].
- Unknown. (2002). *New Zealand's agenda for children: Making life better for children*. Wellington: Ministry of Social Development.
- van den Boom, D. C. (1994). The influence of temperament and mothering on attachment and exploration: An experimental manipulation of sensitive responsiveness among lower-class mothers with irritable infants. *Child Development*, 65, 1457-1477.
- van der Veen, F. (1965). The parent's concept of the family unit and child adjustment. *Journal of Counselling Psychology*, 12, 196-200.
- van IJzendoorn, M. H. (1995). Adult attachment representations, parental responsiveness and infant attachment: A meta-analysis on the predictive validity of the Adult Attachment Interview. *Psychological Bulletin*, 117, 387-403.
- van IJzendoorn, M. H., & Bakermans-Kranenburg, M. J. (1996). Attachment representations in mothers, fathers, adolescents and clinical group: A meta-analytic search for normative data. *Journal of Consulting and Clinical Psychology*, 64, 8-21.
- van IJzendoorn, M. H., Vereijken, C. M. J. L., & Riksen-Walraven, J. M. A. (2000). Is the attachment Q-sort a valid measure of attachment security in young children? In E. Waters & B. E. Vaughn & D. Teti (Eds.), *Patterns of secure base behaviour: Q-sort perspectives on attachment and caregiving*. Mahwah, NJ: Erlbaum.
- Vasey, M. W., & Dadds, M. R. (2001). An introduction to the developmental psychopathology of anxiety. In M. W. Vasey & M. R. Dadds (Eds.), *The developmental psychopathology of anxiety* (pp. 3-26). New York: Oxford University Press.
- Vasey, M. W., Daleiden, E. L., Williams, L. L., & Brown, L. M. (1995). Biased attention in childhood anxiety disorders: A preliminary study. *Journal of Abnormal Child Psychology*, 23, 267-279.
- Vasey, M. W. & MacLeod, C., (2001). Information processing factors in childhood anxiety: A review and developmental perspective, In M. W. Vasey & M. R. Dadds (Eds.), *The developmental psychopathology of anxiety* (pp. 253-277). New York: Oxford University Press.
- Vaughn, B. E., & Bost, K. K. (1999). Attachment and temperament: Redundant, independent or interacting influences on interpersonal adaptation and personality development? In J. Cassidy & P. R. Shaver (Eds.), *Handbook of attachment: Theory, research, and clinical applications* (pp. 198-225). New York: Guilford Press.
- Vaughn, B. E., Lefever, G. B., Seifer, R., & Barglow, R. (1989). Attachment behaviour, attachment security and temperament during infancy. *Child Development*, 60, 728-737.
- Vaughn, B. E., Stevenson-Hinde, J., Waters, E., Kotsaftis, A., Lefever, G. B., Shouldice, A., Trudel, M., & Belsky, J. (1992). Attachment security and temperament in infancy and early childhood: Some conceptual clarifications. *Developmental Psychology*, 28, 463-473.

- Verhulst, F. C., van der Ende, J., Ferdinand, R. F., & Kasius, M. C. (1997). The prevalence of DSM-III-R diagnoses in a national sample of Dutch adolescents. *Archives of General Psychiatry*, 54, 329-336.
- Wallston, K. A. (1992). Hocus-pocus, the focus isn't strictly on locus: Rotter's social learning theory modified for health. *Cognitive Research and Therapy*, 16, 183-189.
- Ward, M. J., & Carlson, E. A. (1995). Associations among adult attachment representations, maternal sensitivity and infant-mother attachment in a sample of adolescent mothers. *Child Development*, 66, 69-79.
- Warren, S. L., Huston, L., Egeland, B. & Sroufe, L.A. (1997). Child and adolescent anxiety disorders and early attachment. *Journal of the American Academy of Child and Adolescent Psychiatry*, 36, 637-644.
- Waters, E. (1978). The reliability and stability of individual differences in infant-mother attachment. *Child Development*, 49, 483-494.
- Waters, E., Hamilton, C., & Weinfield, N. (2000). The stability of attachment security from infancy to adolescence and early adulthood. *Child Development*, 71, 678-683.
- Waters, E., Merrick, S., Treboux, D., Crowell, J., & Athersheim, L. (2000). Attachment security in infancy and young adulthood: a 20-year longitudinal study. *Child Development*, 71(684-689).
- Waters, E., Wippman, J., & Sroufe, L. A. (1979). Attachment, positive affect and competence in the peer group: Two studies in construct validation. *Child Development*, 50, 821-829.
- Watkins, P. C., Vache, K., Verney, S. P., Muller, S., & Mathews, A. (1996). Unconscious mood congruent memory bias in depression. *Journal of Abnormal Psychology*, 105, 34-41.
- Watson, J. B., & Raynor, R. (1920). Conditioned emotional reactions. *Journal of Experimental Psychology*, 3, 1-14.
- Watzlawick, P., Beavin, J., & Jackson, D. D. (1967). *Pragmatics of human communication*. New York: W.W.Norton.
- Weems, C. F., Berman, W. K., Silverman, W. K., & Saavedra, L. M. (2001). Cognitive errors in youth with anxiety disorders: The linkages between negative cognitive errors and anxious symptoms. *Cognitive Therapy and Research*, 25, 559-575.
- Weems, C. F., Silverman, W. K., Rapee, R. M., & Pina, A. A. (2003). The role of control in childhood anxiety disorders. *Cognitive therapy and research*, 27, 557-568.
- Weiss, D. D., & Last, C. G. (2001). Developmental variations in the prevalence and manifestation of anxiety disorders. In M. W. Vasey & M. R. Dadds (Eds.), *The developmental psychopathology of anxiety* (pp. 27-42). New York: Oxford University Press.
- Weisz, J. R. (1980). Developmental change in perceived control: Recognizing noncontingency in the laboratory and perceiving it in the world. *Developmental Psychology*, 16, 385-390.
- Weisz, J. R. (1981). Illusory contingency in children at the state fair. *Developmental Psychology*, 17, 481-489.
- Weisz, J. R. (1986a). Contingency and control beliefs as predictors of psychotherapy outcomes among children and adolescents. *Journal of Consulting and Clinical Psychology*, 54, 789-795.

- Weisz, J. R. (1986b). Understanding the developing understanding of control. In M. Perlmutter (Ed.), *Cognitive perspectives on children's social and behavioral development: Minnesota symposia on child psychology* (Vol. 18, pp. 219-278). Hillsdale, NJ: Erlbaum.
- Weisz, J. R. (1990). Development of control-related beliefs, goals and styles in childhood and adolescence: A clinical perspective. In J. Rodin & C. Schooler & K. W. Schaie (Eds.), *Self-directedness: Cause and effects throughout the life course* (pp. 103-145). Hillsdale, NJ: Erlbaum.
- Weisz, J. R., McCabe, M. A., & Dennig, M. D. (1994). Primary and secondary control among children undergoing medical procedures: Adjustment as a function of coping style. *Journal of Consulting and Clinical Psychology, 62*, 324-332.
- Weisz, J. R., Proffitt, V., & Sweeney, L. (1991). *Unpublished manuscript*. University of California, Los Angeles.
- Weisz, J. R., Rothbaum, F. M., & Blackburn, T. C. (1984). Standing out and standing in: The psychology of control in American and Japan. *American Psychologist, 39*, 955-969.
- Weisz, J. R., Southam-Gerow, M. A., & McCarty, C. A. (2001). Control-related beliefs and depressive symptoms in clinic-referred children and adolescents: Developmental differences and model specificity. *Journal of Abnormal Psychology, 110*, 97-109.
- Weisz, J. R., Stevens, J. S., Curry, J. F., R., C., Craighead, W. E., Burlingame, W. V., Smith, A., Weiss, B., & Parmelee, D. X. (1989). Control related cognition and depression among inpatient children and adolescents. *Journal of the American Academy of Child and Adolescent Psychiatry, 28*, 358-363.
- Weisz, J. R., & Stipek, D. J. (1982). Competence, contingency, and the development of perceived control. *Human Development, 25*, 250-281.
- Weisz, J. R., Sweeney, L., Proffitt, V., & Carr, T. (1993). Control-related beliefs and self-reported depressive symptoms in late childhood. *Journal of Abnormal Psychology, 102*, 411-418.
- Weisz, J. R., Weiss, B., Wasserman, A. A., & Rintoul, B. (1987). Control-related beliefs and depression among clinic-referred children and adolescents. *Journal of Abnormal Psychology, 96*, 58-63.
- Weisz, J. R., Yeates, K. O., Robertson, D., & Beckham, J. C. (1982). Perceived contingency of skill and chance events: A developmental analysis. *Developmental Psychology, 18*, 898-905.
- Werner, E. (1990). Protective factors and individual resilience. In S. J. Meisels & J. P. Shonkoff (Eds.), *Handbook of early childhood intervention* (pp. 97-116). Cambridge, N Y: Cambridge University Press.
- Werner, E. (1993). Risk, resilience and recovery: Perspectives from the Kauai Longitudinal Study. *Development and Psychopathology, 5*, 503-515.
- Whitbeck, L. B., Hoyt, D. R., Simons, R. L., Conger, R. D., Elder, G. H. J., Lorenz, F. O., & Huck, S. (1992). Intergenerational continuity of parental rejection and depressed affect. *Journal of Personality and Social Psychology, 63*, 1036-1045.
- White, R. W. (1959). Motivation reconsidered: the concept of competence. *Psychological Review, 66*, 297-333.

- Wigfield, A., Eccles, J. S., Yoon, K. S., Harold, R. D., Arboreton, A. J. A., Freedman-Doan, C., & Blumenfeld, P. C. (1997). Change in children's competence beliefs and subjective task values across elementary school: a 3-year study. *Journal of Educational Psychology, 89*, 451-469.
- Williams, L. J. & Hazer, J. T. (1986). Antecedents and consequences of organizational turnover: A reanalysis using a structural equations model. *Journal of Applied Psychology, 71*(May), 219-231.
- Williams, S., Anderson, J., McGee, R., & Silva, P. A. (1990). Risk factors for behavioural and emotional disorder in preadolescent children. *Journal of the American Academy of Child and Adolescent Psychiatry, 29*, 413-419.
- Wolfradt, U., Hempel, S., & Miles, J. N. V. (2003). Perceived parenting styles, depersonalisation, anxiety and coping behaviour in adolescents. *Personality and Individual Differences, 34*, 521-532.
- Wolfe, V.V., Finch, A.J.J., Saylor, C.F., Blount, R.L., Pallmeyer, T.P. & Carek, D.J. (1987). Negative affectivity in children: A multitrait-multimethod investigation. *Journal of Consulting and Clinical Psychology, 55*, 245-250.
- Wolman, B. B., & Stricker, G. (Eds.). (1994). *Anxiety and related disorders: A handbook*. New York: Wiley & Sons.
- Yates, R., Kennelly, K., & Cox, S. (1975). Perceived contingency of parental reinforcements, parent-child relations and locus of control. *Psychological Reports, 36*, 139-146.
- Young, J., & Behary, W. T. (1998). Schema-focused therapy for personality disorders. In N. Tarrier & A. Wells & G. Haddock (Eds.), *Treating complex cases: The behavioural therapy approach*. Toronto: J. Wiley & Sons.
- Young, J. E. (1999). *Cognitive therapy for personality disorders: A schema-focused approach* (3 ed.). Sarasota, FL: Professional Resource Press.
- Young, J. E., Weinberger, A. D., & Beck, A. T. (2001). Cognitive therapy for depression. In D. H. Barlow (Ed.), *Clinical handbook of psychological disorders: A step-by-step treatment manual* (pp. 264-308). New York: Guilford Press.
- Younger, A. J., Schwartzman, A. E., & Ledingham, J. (1986). Age-related differences in children's perceptions of social deviance: Changes in behaviour or perspective? *Developmental Psychology, 22*, 531-542.
- Zimmerman, M. A., Salem, D. A., & Maton, K. I. (1995). Family structure and psychosocial correlates among urban African-American adolescent males. *Child Development, 66*, 1598-1613.
- Zinbarg, R. E., & Barlow, D. H. (1996). Structure of anxiety and anxiety disorders: A hierarchical model. *Journal of Abnormal Psychology, 105*(2), 181-193.
- Zvolensky, M. J., Eifert, G. H., Lejuez, C. W., & McNeil, D. W. (1999). The effects offset control over 20% carbon dioxide-enriched air on anxious responding. *Journal of Abnormal Psychology, 108*, 624-632.
- Zweig-Frank, H., & Paris, J. (1991). Parents' emotional neglect and over protection according to the recollections of patients with borderline personality disorder. *American Journal of Psychiatry, 148*, 648-651.

## **APPENDIX A: PARTICIPANT INFORMATION SHEETS AND CONSENT FORMS**

### **INFORMATION SHEETS AND CONSENT FORMS FOR THE STUDY**

- **Child Information Sheet**
- **Child Consent Form**
- **Parent Information Sheet**
- **Parent Consent Form**
- **Information Sheet for Principal, Teachers and Board  
of Trustees**

## INFORMATION SHEET for STUDENTS

### 1. What is this study about and who is doing it?

My name is Nancy Stuart. I am a student at Massey University. I am doing this study as part of my Doctorate in Psychology. This research is looking at what helps school children get along in life.. My supervisor for this project is Dr. Kevin Ronan and he is an associate professor at Massey University.

### 2. What will you be asked to do?

If you and your parents agree, I will be asking you to fill out a questionnaire in class time with the rest of your classmates who agree. Those who do not agree to participate will be somewhere else in the school.

The questionnaire will take about an hour to get through. The first part of the questionnaire will ask questions about what you think. The second part of the questionnaire will be asking questions about some common things kids your age do and what you think about them. The third part of the questionnaire is about problems that some kids have and how they solve them.

No one in your school will know what you write and what you write will not affect anyone in your class. Your answers will only be used for my research and any articles resulting from the research. The general results including a combination of answers from all of the students in the study will be available to you when my research is finished.

Of course, participation is entirely voluntary. If you and your parent choose to participate in this study you have the right to:

- Decide not to participate at any time
- refuse to answer any particular questions
- leave the study at any time
- ask any questions about the study at any time
- give information on the understanding that your names will not be used unless you give specific permission to the researcher
- be given access to a summary of the findings of the study at the end

I will be asking you to return your parent's signed consent form **whether you and your parents say 'yes' to being part of the research or not.** Those children who return their forms will get a 'lucky dip' prize for remembering to show the information to their parents and having them sign the form.

Your parents or teacher may be able to answer the questions you have. If they can't they can contact Dr. Ronan or me with your questions. The contact details are on their information sheets.

## STUDENT CONSENT FORM

I have read the Information Sheet and have had the details of the study explained to me. My questions have been answered, and I understand that I may ask further questions at any time.

I understand I have the right to withdraw from the study at any time and to not answer any particular questions.

I **agree/ do not agree** (cross out one) to participate in this study under the conditions set out in the Information Sheet on the understanding that my name will not be used without my permission.

*(The information will be used only for this research and publications arising from this research project).*

**Signed:** .....

**Name:** .....

**Parent's Name:** .....

**Teacher's Name:** .....

**Date:** .....

## INFORMATION SHEET for PARENTS/GUARDIANS

### 1. What is this study about and who is doing it?

I am Nancy Stuart, a postgraduate student at Massey University. I am undertaking this study as part of my Doctorate in Psychology. This research will be looking at which factors aid children in coping with stress, in an academic setting, with peers and in their behaviour as these are the areas where good coping can lead to success as adults. My supervisor for this project is Dr. Kevin Ronan who is an associate professor at Massey University.

### 2. What will I be asking your child and you to do?

I will be asking your child to fill out a questionnaire, for about an hour in their class time. These will be questions about how they feel, what they think of themselves and how they think what they think of different familiar situations. Those who are not participating will be elsewhere in the school.

No one in your child's school will know what they write and the things they write will not affect anyone in their class.

I will also be asking you to fill out a questionnaire that will take about 30 to 45 minutes of your time. The questions will ask about your child and their early development, your family and how you feel about life as well as how you see your child's behaviour. This questionnaire will be mailed to you, so you can complete it in your own time. A researcher will be available by phone or in person if you have questions as you complete the forms.

Everything that is written on the questionnaires will be entirely confidential. The only person that will know the identity of any particular student or you will be the researcher. Neither the school nor the university will have access to this information. The only thing that the information from these questionnaires will be used for is this research and subsequent professional publications.

A summary of the findings will be available on request at the conclusion of the study.

If you and your child choose to participate in this study you have the right to:

- refuse to answer any particular questions
- withdraw from the study at any time
- ask any questions about the study at any time during participation
- provide information on the understanding that your names will not be used unless you give specific permission to the researcher
- be given access to a summary of the findings of the study when it is concluded

I will be asking your child to return your signed consent form **whether you say 'yes' to being part of the research or not.** Those children who return their forms will get a 'lucky dip' prize for remembering to show the information to you and having you sign the form. Thank you for taking the time to read this. Please feel free to contact Dr. Ronan (06 350 5799 ext.2069) or myself, Nancy Stuart (0800670 392), if you have any questions.

### **CONSENT FORM – PARENT/GUARDIAN**

I have read the Information Sheet. My questions have been answered to my satisfaction, and I understand that I may ask further questions at any time.

I understand my child/ward has the right to withdraw from the study at any time and to decline to answer any particular questions.

I understand that I have the right to withdraw from the study at any time and to decline to answer any particular questions.

I **agree/ do not agree** (delete one) to let my child/ward and myself participate in this study under the conditions set out in the Information Sheet on the understanding that our names will not be used without our permission.

**Signed (Parent/Guardian):** .....

**Date:**.....

**Name (Parent/Guardian) *please print so we can read it:***

.....

**Your Child's Name** .....

**Postal address:** (if participating) .....

Would you like to receive a summary of the findings of this research?  
(Please circle the appropriate answer)      **Yes**      **No**

Thank you.

## **INFORMATION SHEET – Principal, Teachers and Board of Trustees**

### **1. What is this study about and who is doing it?**

This study is partial fulfilment of a Doctorate in Psychology for myself, Nancy Stuart. The research will be looking at which factors aid children in coping with stress in the academic setting, with peers and in their behaviour. My supervisor for this project is Dr. Kevin Ronan, who is an associate professor in Psychology at Massey University.

### **2. What will participants be asked to do?**

After receiving a signed consent from them, I will be asking children between 8 and 11 years and their parents to fill out a questionnaire. The parent's questionnaire consists of measures of their perception of how their child thinks, feels and behaves, what the family rules and ways of being are in their family and generally how they feel about life, themselves.

Everything that is written on the questionnaires will be entirely confidential. The only person that will know the identity of any particular student or know any of the information given by any of the participants will be the researcher. The information from these questionnaires will only be used for this research and subsequent professional publications.

A summary of the findings will be available on request at the conclusion of the study.

Participation will be entirely voluntary and anonymous and participants will have the right to withdraw from the study at any time and to refuse to answer any question.

### **3. What will we be asking of you and you can expect in return?**

We will be asking that you provide a collection place for the consent forms from the children and that a room be provided for us to administer the questionnaires to the children as the questions will be read aloud to them.

In return, we will make administering of the questionnaires fun for the children and will negotiate to give a talk or do a workshop for parents, staff or children on a topic of your choice.

Please feel free to contact me or Dr. Ronan if you have any questions.

Contact numbers Nancy Stuart      03 5787615  
Kevin Ronan      06 350 5799 ext.2069

## **APPENDIX B: Gray's Neurobiological Theory of Behavioural Inhibition and Adult Models of Attachment**

### **Gray's Neurobiological Theory of Behavioural Inhibition (BIS, BAS, FFS)**

Gray (1982; Gray and McNaughton, 1996) describes three neural systems that support temperamental manifestation of emotion and form the neurobiological basis of anxiety. All three systems function from slightly different parts of the brain. The primary system is a Behavioural Inhibition System (BIS) which responds especially to signals of punishment, non reward and novelty. It suppresses ongoing behaviour and refocuses attention on the relevant stimuli. When activated, the BIS would be characterised by increased arousal, increased vigilance and inhibition or cessation of current behavioural activity (Gray & McNaughton, 1996). Gray considered that a sensitive BIS that reacted with exaggerated inhibition to novelty, nonreward and punishment was the biological basis of anxiety. The complementary Behavioural Approach System (BAS) is an approach system which responds to the absence of punishment and reward (safety signals). The third, Fight-Flight System (FFS) is manifested physically as surges of autonomic arousal and the associated need to escape, avoid, or defend aggressively (Gray, 1990; Gray and McNaughton 1996).

This theory appears to be corroborated by both genetic and neuroscientific evidence. As mentioned in Chapter 3, genetic and structural evidence suggests that panic (fear) seems to be related to different genetic factors than does worry (Martin, Jardine, Andrews & Heath, 1988; Kendler, 1996; Kendler, Heath, Martin & Eaves, 1986; Craske, 1999). Also, experiments with rats and monkeys have found that the brain systems, similar to those of humans, which are responsible for fear and panic (amygdala) are likely different from those that are responsible for anxiety and for modulating the startle reaction (i.e., bed nucleus of the stria terminalis or BNST; Davis, 1998; see also Barlow, 2002). These findings add weight to Gray's differentiation between the

BIS and FFS systems and the contention that fear and anxiety could be separate processes. Also, corticotropin-releasing factor (CRF) may be a neurotransmitter that plays a central and complex role with anxiety and depression (Kalin, Shelton & Davidson, 2000; for review see Barlow, 2002). Very recent research has reported the chronic presence of high concentrations of CRF and right frontal brain activity (as found with behaviourally inhibited humans and animals and depressed adults) in rhesus monkeys kept in a state of chronic anxiety over 5 years (Kalin et al., 2000). Hence, evidence from a number of quarters points to neurobiological processes contributing to biological vulnerability for distress. As the present study does not include physiological measures, this area will not be discussed further.

### **Adult Models of Attachment**

The AAI was scored for indicators of current 'state of mind' quality (from content, speech patterns, memory gaps, signs of defensiveness or incongruence) while adults were describing their memories of relationships with their parents (Main, Kaplan & Cassidy, 1985). A meta-analysis of 18 samples totalling 854 dyads (van IJzendoorn, 1995) found overall correspondence between the secure versus insecure Strange Situation response of the infants and the corresponding parent's security vs. insecurity results from the AAI (i.e. an effect size of 1.06). Fonagy et al. (1996) found parents' AAI results and their infants' Strange Situation correlated similarly in both high-risk and middle-class samples. These adults were interviewed before they gave birth and they and the infant-adult dyads were assessed when the infants were 12 months old. Additionally, longitudinal studies have found consistently high correspondence between adolescents' results on the AAI and the attachment category they occupied in the Strange Situation measure as infants (Hamilton, 2000; Waters, Merrick, Treboux, Crowell & Albersheim, 2000). Despite the encouraging corresponding evidence, Main (1996) warned that the two measures could not be validly related as discourse

analysis of coherence and collaboration could not be considered conceptually similar to the response of an infant when their mother leaves and returns to the strange place she has left them in (Main, 1996).

Hazan and Shaver (1987) assessed romantic relationships and elicited beliefs, feelings and perceived self-actions in close relationships based on the secure, anxious (labelled preoccupied) and avoidant classifications in children (Ainsworth, Blehar, Waters, & Wall, 1978). They created a prototype endorsement measure based on the assumptions behind these three classifications. Results from several ensuing studies showed that compared with those endorsing the secure self-description, the two groups who endorsed the insecure self-description (preoccupied and avoidant) reported shorter romantic relationships, more negative romantic experiences and reported less satisfying descriptions of their historical relationships with their own parents. They expressed more self-doubt and the perception that they were less acceptable to others (for review, see Shaver & Hazan, 1993). This suggested that their view of self and others may be affecting their choices in relationships.

Hazan & Shaver's (1987) findings supported Bowlby's theory that by late adolescence and adulthood, friendship and romantic relationships were formed based on the unconscious desire to reconstruct the early attachment patterns. Consequently, adults with a secure style were comfortable with being intimate and were able to take the perspective of others and help them; those with an avoidant style were less able to trust others and uncomfortable with intimacy; while those with a preoccupied style felt unable to get close enough to others and were worried about being abandoned. Other researchers had similar findings with different attachment styles also differing in their beliefs about relationships, their satisfaction with relationships and their emotional reactions to relationships (Collins & Read, 1990; Feeney & Noller, 1990; Kirkpatrick &

Davis, 1994; Simpson, 1990). Further research has related the preoccupied attachment category with anxious and depressive symptoms. Eng, Heimberg, Hart, Schneider and Liebowitz (2001) used a questionnaire measure based on the Hazan and Shaver (1987) prototypes in the study of 118 individuals diagnosed with social anxiety disorder (DSM-IV). The preoccupied attachment group reported more severe symptoms, less satisfaction with life and were more often depressed than those who were securely attached. Although the securely attached individuals did experience social anxiety, they had less severe symptoms and were less depressed, suggesting that a secure attachment may be a protection against the more severe symptoms.

### Appendix B References

#### Gray's Neurobiological Theory of Behavioural Inhibition

- Barlow, D. H. (2002). *Anxiety and its disorders: The nature and treatment of anxiety and panic* (2nd ed.). New York: Guilford Press.
- Craske, M. G. (1999). *Anxiety disorders: Psychological approaches to theory and treatment*. Colorado: Westview Press.
- Davis, M. H. (1998). Are different parts of the extended amygdala involved in fear versus anxiety? *Biological Psychiatry*, 44, 1239-1247.
- Gray, J. A. (1982). *The neuropsychology of anxiety*. New York: Oxford University Press.
- Gray, J. A. (1990). Brain systems that mediate both emotion and cognition. *Cognition and Emotion*, 4, 269-288.
- Gray, J. A., & McNaughton, N. (1996). The neuropsychology of anxiety: Reprise. In D. A. Hope (Ed.), *Nebraska Symposium on Motivation: Perspectives on anxiety, panic and fear* (Vol. 43). Lincoln: University of Nebraska Press.
- Kalin, N. H., Shelton, S. E., & Davidson, R. J. (2000). Cerebrospinal fluid corticotrophin-releasing hormone levels are elevated in monkeys with patterns of brain activity associated with fearful temperament. *Biological Psychiatry*, 47, 579-585.
- Kendler, K. S. (1996). Major depression and generalised anxiety disorder: same genes, (partly) different environments--revisited. *British Journal of Psychiatry*, 168(Suppl. 30), 68-75.
- Kendler, K. S., Heath, A. C., Martin, N. G., & Eaves, L. J. (1986). Symptoms of anxiety and depression in a volunteer twin population: The etiologic role of genetic and environmental factors. *Archives of General Psychiatry*, 43, 213-221.
- Martin, N. G., Jardine, R., Andrews, G., & Heath, A. C. (1988). Anxiety disorders and neuroticism: Are there genetic factors specific to panic? *Acta Psychiatrica Scandinavica*, 77, 698-706.

### Adult Models of Attachment

- Ainsworth, M. D., S, Blehar, M. C., Waters, E., & Wall, E. (1978). *Patterns of attachment: A psychological study of the strange situation*. Hillsdale, NJ: Erlbaum.
- Collins, N. L., & Read, S. J. (1990). Adult attachment, working models and relationship quality in dating couples. *Journal of Personality and Social Psychology*, 58, 644-663.
- Eng, W., Heinberg, R. G., Hart, T. A., Schneier, F. R., & Liebowitz, M. R. (2001). Attachment in individuals with social anxiety disorder: The relationship among adult attachment styles, social anxiety and depression. *Emotion*, 1(4), 365-380.
- Feeney, J. A. & Noller, P. (1990). Attachment style as a predictor of adult romantic relationships. *Journal of Personality and Social Psychology*, 58, 281-291.
- Fonagy, P., Leigh, T., Steele, M., Steele, H., Kennedy, R., Mattoon, G., Target, M., & Gerber, A. (1996). The relation of attachment status, psychiatric classification and response to psychotherapy. *Journal of Consulting and Clinical Psychology*, 64, 22-31.
- Hamilton, C. E. (2000). Continuity and discontinuity of attachment from infancy through adolescence. *Child Development*, 71, 690-694.
- Hazan, C., & Shaver, P. R. (1987). Romantic love conceptualised as an attachment process. *Journal of Personality and Social Psychology*, 52, 511-524.
- Kirkpatrick, L. A., & Davis, K. E. (1994). Attachment style, gender, and relationship stability: A longitudinal analysis. *Journal of Personality and Social Psychology*, 66(3), 502-512.
- Main, M. (1996). Introduction to the special section on attachment and psychopathology: Overview of the field of attachment. *Journal of Consulting and Clinical Psychology*, 64, 237-243.
- Main, M., Kaplan, N., & Cassidy, J. (1985). Security in infancy, childhood and adulthood: A move to the level of representation. *Growing points of attachment theory research: Monographs of the Society for Research in Child Development*, 50(1-2), Serial No. 209.
- Shaver, P.R. & Hazan, C. (1993). Adult romantic attachment: Theory and evidence. In D.Perlman & W.H. Jones (Eds.), *Advances in personal relationships* (Vol. 44, pp. 29-70). London: Jessica Kingsley.
- Simpson, J. A. (1990). Influence of attachment styles on romantic relationships. *Journal of Personality and Social Psychology*, 59, 971-980.
- van IJzendoorn, M. H. (1995). Adult attachment representations, parental responsiveness and infant attachment: A meta-analysis on the predictive validity of the Adult Attachment Interview. *Psychological Bulletin*, 117, 387-403.

## **Appendix C: Conceptualisations related to Perceived Control**

### **Locus of control**

Early studies of control in human children predominantly involved self-report measures of locus of control, first introduced by Rotter (1966). Rotter (1966) defined a dimension of control, 'locus of control' as existing along a continuum between external and internal causality. Thus, 'locus of control' was seen to be the degree to which an individual perceived personal control over reinforcement in their environment (internal e.g., competence or effort) compared to perceptions of control originating from outside the person (external e.g., luck, powerful others or a combination of many environmental factors). Higher scores of externality reflected a lower sense of control and were therefore expected to be associated with higher levels of distress. The expectancy of this perception was assumed to be generalised from previous experiences with internal and external reinforcement in similar situations (Rotter, 1966). As this generalised expectancy "captured the imagination of researchers around the world" (Wallston, 1992, p. 184), other parts of Rotter's social learning theory were lost, particularly the value component of the expectancy-value theory and Rotter's belief in domain-specific expectancies rather than general expectancies predicting behaviours (Rotter, 1975). These omissions lead Wallston (1992) to revise the theory and make it specific to the domain of health, but were not reflected in the measure used most (Nowicki-Strickland Locus of Control Scale; NSLOC, 1973).

External locus of control scores on the NSLOC have correlated with anxiety scores within a normal sample (Nunn, 1988) and in a clinical sample of anxious children (Finch & Nelson, 1974). Similar findings were demonstrated with depressed children (McCauley, Mitchell, Burke & Moss, 1988) and paralleled those found in adult populations (Hoehn-Saric & McLeod, 1985). Chorpita, Brown & Barlow (1998) used this measure with a mainly clinical sample of children and found control perceptions mediated the relationship between family environment and negative

affect in middle childhood, suggesting that perceived control could have a central role to play in the aetiology of childhood anxiety and depression.

Although initially seen to be both reliable and valid, more recent arguments have suggested that locus of control (as measured by Nowicki and Strickland's 1973 NCLOC measure) may be too general a construct (i.e. unidimensional and not domain-specific) and less representative of the aspects of control that may be directly relevant to negative emotions (Rapee, Craske, Brown & Barlow, 1996; Chorpita, Brown & Barlow, 1998). Difficulties have included: the non-differentiation between contingency judgements and personal competency judgements which appear to affect psychopathology differently (e.g., Skinner, Chapman, & Baltes, 1988; Weisz et al., 1989); the exclusion of specific control domains (i.e. academic, social, behavioural) which have been seen to affect outcomes differently (e.g., Burger, 1989; Han, Weisz & Weiss, 2001; Wallston, 1992; Weisz, Weiss, Wasserman, & Rintoul, 1987). Additional problems arose when an internal and external locus of control measure (Rotter, 1966) was found to have two distinctly different dimensions (Levenson, 1974), suggesting that a more specific measure may need to be developed.

### **Attribution theory/Learned Helplessness/Explanatory Style**

In attribution theory (Weiner, 1985a), a means-ends relationship with implied agent-means, expanded the locus of control concept (Rotter, 1966) suggesting that the perceived causes of past successes or failures (which people spontaneously tended to analyse, especially failures; Weiner, 1985b) were not only determined by the dimension internality but also by stability (Weiner, 1985a). From this perspective, Weiner and colleagues (Weiner, Heckhausen, Meyer & Cook, 1972; Weiner, Nierenberg & Goldstein, 1976) reformulated control perceptions along three dimensions: internal versus external locus (similar to Rotter); stable versus unstable causes (relatively constant versus causes that changed across situations and over time) and controllable versus uncontrollable

(voluntarily controllable versus externally controlled causes). These dimensions were designed to explain events in hindsight in order to predict outcomes of future events (Antaki, 1982). Hence, attributing outcome of an event to internal, stable and controllable causation could enhance feelings of control, even when the outcome was not favourable. Chorpita and Barlow (1998) suggested that since attributions explained past events, they did not, as directly, relate to the future oriented experience of 'anxious apprehension' characteristic of negative affectivity.

Seligman's (1975) work on the effects of loss of control (learned helplessness) on behaviour, motivation and emotion provided a future orientation. Famous experiments using shock with dogs (see Seligman, 1975 for review) lead to this theoretical formulation of learned helplessness defined as an individual's belief that, as a result of a series of negative life events, they had no control over future outcomes (Seligman, 1975). It was conceptualised that the belief that actions could not change results, would negatively affect subsequent performance even when contingency actually existed. Prolonged exposure to this belief would lead to symptoms like passivity, apathy and depressed affect and sometimes death (Seligman, 1975). For various reasons (see Peterson, Maier & Seligman, 1993 for details), Abramson, Seligman and Teasdale (1978) reformulated this theory and integrated Weiner et al.'s (1972) concept of attributions into the construct of learned helplessness. In this reformulation, one's attributional pattern or explanatory style (i.e. attributing outcomes to internal or external, stable or unstable and global, across-situation, or specific, within situation, causes) was seen to moderate the relationship between negative life events and learned helplessness. That is, negative life events could lead to learned helplessness only when a person made internal, stable and global attributions about the negative events. Abramson, Metalsky and Alloy (1989) modified this theory further suggesting a pathway from anxiety to depression on a continuum of increasing loss of control with feelings of hopelessness being more associated to depression and helplessness more specific to anxiety. They also suggested that pessimistic attributions only

caused depression if they pertained to the specific domain of the individual's felt-hopelessness. Children with depressive symptoms were found to make causal attributions that reflected learned helplessness and low control perceptions (Nolen-Hoeksema, Girgus, & Seligman, 1986; Seligman et al., 1984; Siegel & Griffin, 1984). A five year investigation by Nolen-Hoeksema, Girgus and Seligman (1992) found that depression in younger children (8 years) was not related to negative attributions but to the negative events themselves. However, young depressed children began increasingly to develop pessimistic attributions which appeared to cause relapse when they were faced with negative life events. This suggested a developmental trajectory. Despite some conceptual overlap, these constructs are different from Barlow's understanding of control (i.e. competence and contingency in Weisz's theory) in that personal and universal helplessness describe potential reactions to the loss of subjective or objective control, whereas competence and contingency refer to factors in the person and environment that influence the controllability of events and outcomes (Barlow, 2002). Chorpita, Brown and Barlow (1998) did not find attributions to significantly differentiate clinically anxious children from controls, suggesting two possibilities: either this construct did not clearly discriminate or anxious children do not develop a pessimistic attributional style (e.g., Kaslow, Stark, Printz, Livingston, & Tsai, 1992).

### **Self-efficacy**

In reacting to locus of control and learned helplessness theories' primary focus on contingency constructs, Bandura (1977, 1986) contended that an individual needed to be convinced that they could perform the given behaviour before they would attempt the task no matter how strongly they believed that it could be done. Behaviour change was, therefore, determined by both outcome expectations (i.e. contingency or the individual's assessment that a particular action or behaviour would lead to a desired outcome) and efficacy expectations (i.e. competence or the belief that one could perform in order to produce the desired outcome). This combination of components he labelled 'self-efficacy' theory.

Bandura (1986) suggested that beliefs about personal competence or 'self-efficacy' could differ in magnitude (degree of difficulty the person thinks they could manage), generality (range of domains they expected to be effective in) and strength (the ease with which the person's expectancy could be extinguished). He also believed that "people's judgements of their capabilities influence[d] their thought patterns and emotional reactions" (Bandura, 1982, p.123) thus suggesting a connection between competency perceptions and psychopathology. For example, in his early work with anxiety and phobic reactions, Bandura (1982) found supporting evidence that self-efficacy had a mediating role between fear reaction and treatment outcome, regardless of the mode of treatment used (Bandura & Adams, 1977, cited in Bandura, 1982). The individual's direct experiences were involved in self-efficacy expectations with mastery continuing to reinforce the sense of self-efficacy. Barlow suggested that the difference between his and Bandura's conceptualisations lay in the difference between actual and potential influence over outcome. Barlow suggested that his and Weisz's (1990) construct of "control was related to the degree to which an organism [had] the possibility to influence opportunities for positive or negative reinforcement" (Barlow, 2002, pp. 277), and did not depend on the organism's actual performance, while Bandura's (1989) self-efficacy construct was more connected to performance. However, part of Weisz's model included perceptions of competence.

### **Perceived Competence**

The study of children's perceptions of their competence has been examined as a stand alone cognitive construct and in relationship to other constructs including perceived control in relation to predictors for success (Skinner, Zimmer-Gembeck & Connell, 1998). Competency constructs have been applied to children's academic performance, in isolation (Helmke & van Aken, 1995; Phillips 1984, 1987); combined with expectancy-value theories (e.g., Eccles, Wigfield, Harold & Blumenfeld, 1993; Roeser, Midgley & Urdan, 1996) and combined with effectance

motivation theories (Harter, 1982; Harter & Connell, 1984; Harter, Whitesell & Kowalski, 1992).

Competence was initially related to self-esteem with James (1892/1963 cited in Harter, 1985a) suggesting that the relationship between competence and wishes for the future was a critical part of self-evaluation (Harter, 1985a). White (1959) underscored the ecological and developmental aspects of competence suggesting that an infant inherently was motivated towards the pleasure of affectively engaging with and mastering their environment. Elliot, McGregor and Thrash (2002) furthered the concept by suggesting that this initial need for engagement developed and became more complex over time as experiences accumulated into working models, "serving the biological and evolutionary function of adaptation to the environment" (Elliot, McGregor & Thrash, 2002, pp. 365). Consequently, the degree to which the person's need for competence was fulfilled at each opportunity cumulatively affected their degree of well-being. They further connected this function biologically with Gray's BAS system (discussed in Chapter 5) as one of the biological circuits that contributed directly to the expression of competence. They (see also Gray, 1990) explained that the BAS appears to be responsible for activating approach-oriented responses to stimuli and inducing positive emotions both anticipatory and reactive (Gray, 1990). Although the need for competence requires more specificity than what happens in the BAS, Elliot and Thrash (2002) believed that it was one of the circuits that contributed directly to the need for competence. In a series of studies conducted with a university sample, factor analysis of various personality measures consistently yielded a two-factor structure representing what they labelled approach temperament (extraversion, positive emotionality, BAS) and avoidance temperament (neuroticism, negative emotionality, BIS). Further, BAS, extraversion, and positive emotionality were each positive predictors of mastery while BIS, neuroticism, and negative emotionality were unrelated to mastery. BAS was a negative predictor and BIS was a positive predictor of avoidance (relative to approach) of personal achievement

goals and were independent of either sex or ability lending further credence to the connection. Although they describe behaviour activation more broadly than Gray (1990) and to date their research has been conducted on undergraduates and not children, the connection between this work and negative affectivity holds promise in determining the amount of competence variance is accounted for by heredity (Elliot and Thrash, 2002). Barlow (2002) has linked the BIS and BAS suggesting that reactivity of the BIS (i.e. anxious apprehension) is affected by an inherited biological vulnerability to emotionality; the sense of control influences the strength of its signals and BAS activation (which contributes to the expression of competence; Elliot & Thrash, 2002) would moderate the BIS output. More research is required to determine how these constructs are connected biologically and environmentally (Elliot & Thrash, 2002).

#### Appendix C References

- Abramson, L. Y., Metalsky, G. I., & Alloy, L. B. (1989). Hopelessness depression: A theory-based subtype of depression. *Psychological Review*, 96, 358-372.
- Abramson, L. Y., Seligman, M. E. P., & Teasdale, J. D. (1978). Learned helplessness in humans: Critique and reformulation. *Journal of Abnormal Psychology*, 87, 49-74.
- Antaki, C. (1982). A brief introduction to attribution and attributional theories. In C. Antaki & C. Brewin (Eds.), *Attributions and psychological change: Applications of attributional theories to clinical and education practice* (pp. 3-21). London: Academic Press.
- Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, 84, 191-215.
- Bandura, A. (1982). Self-efficacy mechanism in human agency. *American Psychologist*, 37, 122-147.
- Bandura, A. (1986). *Social foundations of thought and action*. Englewood Cliffs, NJ: Prentice-Hall.
- Bandura, A. (1989). Perceived self-efficacy in the exercise of personal agency. *British Psychological Society*, 10, 411-424.
- Bandura, A., Adams, N. E., & Beyer, J. (1977). Cognitive processes mediating behavioral change. *Journal of Personality and Social Psychology*, 35, 125-139.
- Barlow, D. H. (2002). *Anxiety and its disorders: The nature and treatment of anxiety and panic* (2nd ed.). New York: Guilford Press.
- Burger, J. M. (1989). Negative reactions to increases in perceived personal control. *Journal of Personality and Social Psychology*, 56, 246-256.
- Chorpita, B. F., & Barlow, D. H. (1998). The development of anxiety: The role of control in the early environment. *Psychological Bulletin*, 124, 3-21.

- Chorpita, B. F., Brown, T., & Barlow, D. H. (1998). Perceived control as a mediator of family environment in etiological models of childhood anxiety. *Behaviour Therapy*, 29, 457-476.
- Eccles, J. S., Wigfield, A., Harold, R. D., & Blumenfeld, P. C. (1993). Age and gender differences in children's achievement self-perceptions during the elementary school years. *Child Development*, 64, 830-847.
- Elliot, A. J., McGregor, H. A., & Thrash, T. M. (2002). The need for competence. In E. L. Deci & R. M. Ryan (Eds.), *Handbook of self-determination research* (pp. 361-388.). Rochester, NY: University of Rochester Press.
- Elliot, A. J., & Thrash, T. M. (2002). Approach-avoidance motivation in personality: Approach and avoidance temperaments and goals. *Journal of Personality and Social Psychology*, 82, 804-818.
- Finch, A.J. & Nelson, W.M. (1974). Locus of control and anxiety in emotionally disturbed children. *Psychological Reports*, 35, 469-470.
- Gray, J. A. (1982). *The neuropsychology of anxiety*. New York: Oxford University Press.
- Gray, J. A. (1990). Brain systems that mediate both emotion and cognition. *Cognition and Emotion*, 4, 269-288.
- Han, S. S., Weisz, J. R., & Weiss, B. (2001). Specificity of relations between children's control-related beliefs and internalising and externalising psychopathology. *Journal of Consulting and Clinical Psychology*, 69(2), 240-251.
- Harter, S. (1982). The perceived competence scale for children. *Child Development*, 53, 87-97.
- Harter, S. (1985a). Competence as a dimension of self-evaluation: Toward a comprehensive model of self-worth. In R. L. Leahy (Ed.), *The development of the self*. Orlando: Academic Press Inc.
- Harter, S. (1985b). *Manual for the Self-Perception Profile for Children*.: University of Denver.
- Harter, S., & Connell, J. P. (1984). A model of the relationships among children's academic achievement and their self-perceptions of competence, control and motivational orientation. In J. G. Nicholls (Ed.), *The development of achievement motivation*. Greenwich, CT: JAI.
- Harter, S., Whitesell, N., & Kowalski, P. (1992). Individual differences in the effects of educational transitions on young adolescent's perceptions of competence and motivational orientation. *American Educational Research Journal*, 29, 777-807.
- Helmke, A. & van Aken, M. (1995). The causal ordering of academic achievement and self-concept of ability during elementary school. *Journal of Educational Psychology*, 87, 624-637.
- Hoehn-Saric, R., & McLeod, D. (1985). Locus of control in chronic anxiety disorders. *Acta Psychiatrica Scandinavica*, 72, 529-535.
- Kaslow, N. J., Stark, K. D., Printz, B., Livingston, R., & Tsai, S. L. (1992). Cognitive Triad Inventory for children: Development and relation to depression and anxiety. *Journal of Clinical Child Psychology*, 21(4), 339-347.
- Levenson, H. (1974). Activism and powerful others: Distinctions within the concept of external-internal control. *Journal of Personality Assessment*, 38, 1097-1110.

- McCauley, E., Mitchell, J., Burke, P. & Moss, S. (1988). Cognitive attributes of depression in children and adolescents. *Journal of Consulting and Clinical Psychology*, 56, 903-908.
- Nowicki, S., & Strickland, B. R. (1973). A locus of control scale for children. *Journal of Consulting and Clinical Psychology*, 40, 148-154.
- Nunn, G. D. (1988). Concurrent validity between the Norwicki-Strickland Locus of Control Scale and the State-Trait Anxiety Inventory for Children. *Educational and Psychological Measurement*, 48, 435-438.
- Peterson, C., Maier, S. F., & Seligman, M. E. P. (1993). *Learned helplessness: A theory for the age of personal control*. New York: Oxford University Press.
- Phillips, D. A. (1984). The illusion of incompetence among academically competent children. *Child Development*, 58, 2000-2016.
- Phillips, D. A. (1987). Socialisation of perceived academic competence among highly competent children. *Child Development*, 58, 1308-1320.
- Rapee, R. M., Craske, M. G., Brown, T., & Barlow, D. H. (1996). Measurement of perceived control over anxiety related events. *Behavior Therapy*, 27, 279-293.
- Roeser, R., Midgley, C., & Urdan, T. C. (1996). Perceptions of the school psychological environment and early adolescents' psychological and behavioural functioning in school: The mediating role of goals and belonging. *Journal of Educational Psychology*, 88, 408-422.
- Rotter, J. B. (1966). Generalised expectancies for internal versus external control of reinforcement. *Psychological Monographs*, 80(1 Whole No. 609).
- Rotter, J. B. (1975). Some problems and misconceptions related to the construct of internal versus external control of reinforcement. *Journal of Consulting and Clinical Psychology*, 43, 56-67.
- Seligman, M. E. P. (1975). *Helplessness*. San Francisco: Freeman.
- Seligman, M. E. P. (1991). *Learned optimism*. New York: Knopf.
- Seligman, M. E. P., Peterson, C., Kaslow, N. J., Tanenbaum, R. L., Alloy, L. B., & Abramson, L. Y. (1984). Attributional style and depressive symptoms among children. *Journal of Abnormal Psychology*, 93, 235-238.
- Siegel, L. J., & Griffin, N. J. (1984). Correlates of depressive symptoms in adolescents. *Journal of Youth and Adolescence*, 13, 475-487.
- Skinner, E. A., Chapman, M., & Baltes, P. B. (1988). Control, means-ends, and agency beliefs: A new conceptualisation and its measurement during childhood. *Journal of Personality and Social Psychology*, 54, 117-133.
- Wallston, K. A. (1992). Hocus-pocus, the focus isn't strictly on locus: Rotter's social learning theory modified for health. *Cognitive Research and Therapy*, 16, 183-189.
- Weiner, B. (1985a). An attributional theory of achievement motivation and emotion. *Psychological Review*, 92, 548-573.
- Weiner, B. (1985b). Spontaneous causal thinking. *Psychological Bulletin*, 97, 74-84.
- Weiner, B., Heckhausen, H. Meyer, W., & Cook, R.E. (1972). Causal ascriptions and achievement behavior: A conceptual analysis of effort and reanalysis of locus of control. *Journal of Personality and Social Psychology*, 21, 239-248.

- Weiner, B., Nierenberg, R. & Goldstein, M. (1976). Social learning (locus of control) versus attributional (causal stability) interpretations of expectancy of success. *Journal of Personality and Social Psychology*, 44, 52-68.
- Weisz, J. R., Stevens, J. S., Curry, J. F., R., C., Craighead, W. E., Burlingame, W. V., Smith, A., Weiss, B., & Parmelee, D. X. (1989). Control related cognition and depression among inpatient children and adolescents. *Journal of the American Academy of Child and Adolescent Psychiatry*, 28, 358-363.
- Weisz, J. R., Weiss, B., Wasserman, A. A., & Rintoul, B. (1987). Control-related beliefs and depression among clinic-referred children and adolescents. *Journal of Abnormal Psychology*, 96, 58-63.
- White, R. W. (1959). Motivation reconsidered: the concept of competence. *Psychological Review*, 66, 297-333.

Appendix D: Notes about Further Results Analyses

1. To determine whether this mediation relationship was not a result of shared child method variance, this model was respecified using a parent indicator for Family Control (see Figure 1a). Fit indices for this model were better than the first with GFI .95, CFI .96, RMSEA .069 *p*close .054, AIC 122.8. Also, with the parent perception measure, Perceived Control fully mediated the relationship between Family Control and Anxiety and Depressive symptoms.

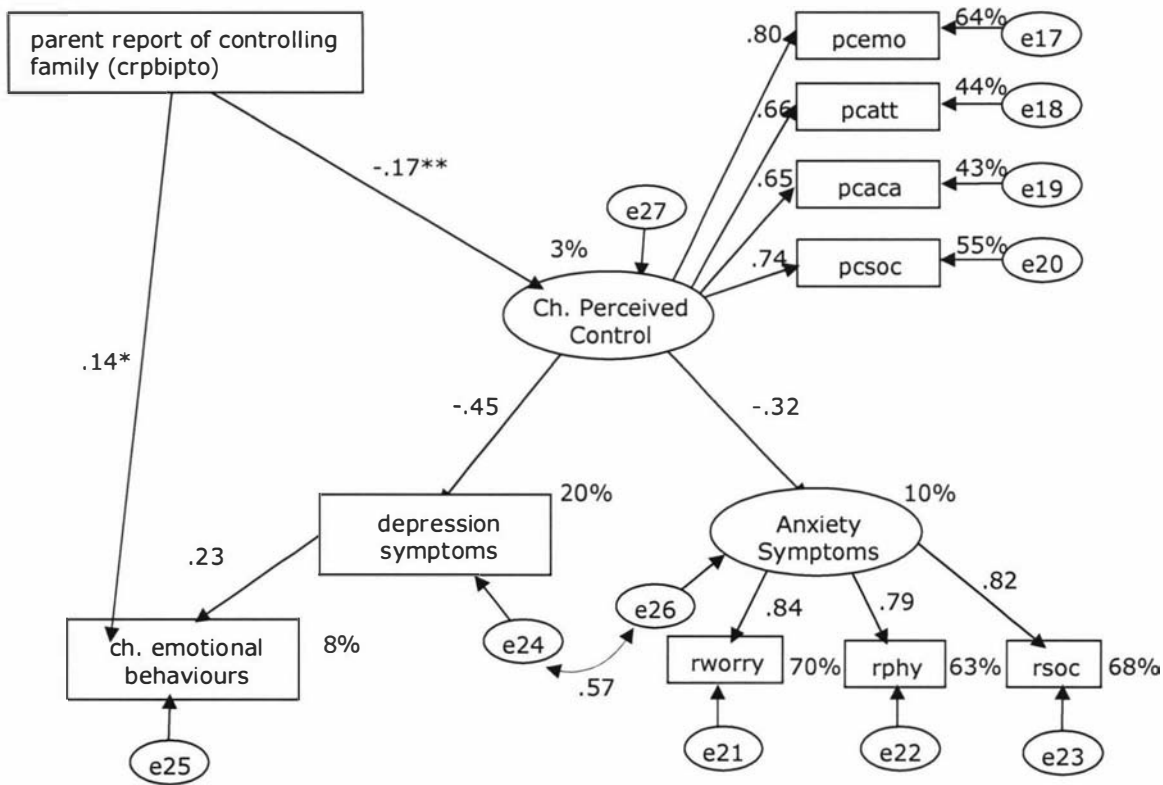


Figure 1a. Path Diagram of the Replicated Mediation Model using more precise measures and Parent-perceived Controlling Family Environment. crpbipto = parent report child perceived parent behaviour inventory. pcemo = perceived emotional control. pcatt = perceived attachment control. pcaca = perceived academic control. pcsoc = perceived social control. rworry = RCMAS worry. rphy = RCMAS physiological anxiety. rsoc = RCMAS social concerns. All parameter values are standardised. Most parameters  $p < .001$  except two where  $*p < .05$ .  $**p < .01$ .

1a. Using a single factor for the criterion variables as with the original study, the path coefficients remained comparable (between child-

perceived Parental Control and Perceived Control  $-.46, p < .05$  and from Perceived Control to Negative Affect  $-.37, p < .001$ ). A partial mediation was also achieved (path coefficients of when Parent Control/PC correlated and  $.57$  or  $3.0$ , when PC constrained  $.67$  or  $4.3$ ) suggesting the difference between the two studies was not as a result of differing criterion variables. This single factor criterion variables model explained only 14% of the variance in Negative Affect as compared with 34% explained in the Chorpita, Brown and Barlow (1998) model.

2. Because of the sample size, a limited number of indicator variables were able to be used in SEM. With reluctance, only the variables that were strictly related to the theory and hypotheses were included. For example, some temperament subscales, child and parent measures of temperamental activity and sociability were eliminated as child emotionality and shyness were closer to Kagan's behavioural inhibition (Barlow, 2002) and parental fearfulness and anger were seen as more relevant to engendering anxiety for the adult vulnerabilities. Equally, the emotionality scale of the SDQ was chosen to represent the parent's perception of child distress in the model. Also, other indicators were eliminated because of their low communalities or relatively equal loadings on several factors (e.g., perceived control and competence behavioural subscales and family activity subscale) and therefore inability to describe much or clear variance during factor analysis (Tabachnick & Fidell, 2001). Further variables were assessed in the SEM process. Parent distress appeared to be multicollinear with parent fear and seemed to be influenced by method variance as it correlated too highly with the parent perceived child emotionality indicator. This indicator was therefore replaced by a theoretically equivalent one (adult manifest anxiety total) according to the recommendations of Hair et al.. (1998).

3. In order to determine whether the item content and sample differences made the cognitive constructs perform differently in relationship to criterion variables than the Weisz et al.. (2001) study, a separate analysis was done using only the perceived control, perceived competence,

anxiety and depressive symptoms. The fit of this model was reasonable with GFI .94, CFI .95, RMSEA .08 *p*close .003. Only the RMSEA fit index was not within limits, suggesting that the observed data only marginally fit the hypothesised model. As this was only a comparison, this issue was not addressed. The amount of variance in self-reported depressive symptoms explained by the control-related constructs was 40%--a result similar to what Weisz et al. (2001) found, suggesting that the differences in construct indicators and sample characteristics did not seem to have a major effect on outcomes.

#### Appendix D References

- Barlow, D. H. (2002). *Anxiety and its disorders: The nature and treatment of anxiety and panic* (2nd ed.). New York: Guilford Press.
- Chorpita, B. F., Brown, T., & Barlow, D. H. (1998). Perceived control as a mediator of family environment in etiological models of childhood anxiety. *Behaviour Therapy*, 29, 457-476.
- Hair, J. F. J., Anderson, R. E., Tatham, R. L., & Black, W. C. (1998). *Multivariate data analysis* (5th ed.). New Jersey: Prentice Hall.
- Tabachnick, B. G., & Fidell, L. S. (2001). *Using Multivariate statistics* (4 ed.). Boston: Allyn and Bacon.
- Weisz, J. R., Southam-Gerow, M. A., & McCarty, C. A. (2001). Control-related beliefs and depressive symptoms in clinic-referred children and adolescents: Developmental differences and model specificity. *Journal of Abnormal Psychology*, 110, 97-109.