ALEXITHYMYA AND ATTACHMENT
IN
EATING DISORDERS

by

Susan Lynne Selway

A thesis submitted in partial fulfilment of the requirements
for the degree of
Master of Science in Psychology
at the
University of Canterbury

University of Canterbury
2002
# CONTENTS

<table>
<thead>
<tr>
<th>Table of Contents</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>List of Tables</td>
<td>v</td>
</tr>
<tr>
<td>List of Figures</td>
<td>vi</td>
</tr>
<tr>
<td>List of Appendices</td>
<td>vii</td>
</tr>
<tr>
<td>Acknowledgements</td>
<td>viii</td>
</tr>
<tr>
<td>Abstract</td>
<td>1</td>
</tr>
</tbody>
</table>

## 1. INTRODUCTION

### 1.1 Overview

### 1.2 The Alexithymia Construct

1.2.1 The construct defined

1.2.2 Evidence of disruption in the emotion system

### 1.3 The Origins of Alexithymia

1.3.1 Caregiver involvement in emotional development

1.3.2 Attachment relationships and emotional development

1.3.3 Continuity of attachment

1.3.4 Reconceptualisation of adult attachment as continuous

### 1.4 Parental Care as a Determinant of Attachment Style

1.4.1 Evidence linking alexithymia with attachment and parental bonding

### 1.5 Eating Disorders: Description of Anorexia Nervosa and Bulimia Nervosa

1.5.1 Etiology of eating disorders

1.5.2 Alexithymia and eating disorders

1.5.3 Family factors, attachment and eating disorders

### 1.6 The Relationship between Alexithymia, Depression, and Anxiety

1.6.1 Sociodemographic variables

### 1.7 The Research Hypotheses
Table of Contents (continued)

2. METHOD .............................................................................................................44

2.1 Overview .........................................................................................................44

2.2 Participants .....................................................................................................44
   Eating disorders group .....................................................................................44
   Comparison group ............................................................................................46

2.3 Measures .........................................................................................................47
   Alexithymia .......................................................................................................47
   Parental bonding ...............................................................................................48
   Adult attachment dimensions .........................................................................51
   Anxiety .............................................................................................................52
   Depression .......................................................................................................53
   Eating attitudes and behaviours and associated psychological themes ........54

2.4 Conceptual Overlap between Scales ............................................................56

2.5 Procedure .......................................................................................................57

2.6 Contingency for Dealing with Risk of Harm ..................................................58

2.7 Data Analysis ................................................................................................59

3. RESULTS .........................................................................................................60

3.1 Overview .......................................................................................................60

3.2 Evaluation of the Eating Disorders and Comparison Groups .......................60
   3.2.1 Descriptive statistics .............................................................................60
   Age ..................................................................................................................60
   Education .......................................................................................................61
   Ethnicity .........................................................................................................62
   Body mass index .............................................................................................62
   3.2.2 Group differences with respect to scales ................................................62
   Alexithymia .....................................................................................................63
   Interaction between education and alexithymia .............................................64
   Parental bonding .............................................................................................64
   Attachment dimensions in adulthood ............................................................65
   Depression .......................................................................................................65
   Anxiety ............................................................................................................66
   Disordered eating attitudes and associated themes .......................................66
<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.3 Associations Between Variables</td>
<td></td>
</tr>
<tr>
<td>3.3.1 Group differences in alexithymia: depression and anxiety</td>
<td>67</td>
</tr>
<tr>
<td>as potential confounds</td>
<td></td>
</tr>
<tr>
<td>3.3.2 Relationship between parental bonding, adult attachment style</td>
<td>68</td>
</tr>
<tr>
<td>and alexithymia</td>
<td></td>
</tr>
<tr>
<td>Association between parental bonding and dimensions of adult attachment</td>
<td>69</td>
</tr>
<tr>
<td>Association between parental bonding and alexithymia</td>
<td>70</td>
</tr>
<tr>
<td>Association between parental bonding, adult attachment dimensions and</td>
<td></td>
</tr>
<tr>
<td>alexithymia</td>
<td>73</td>
</tr>
<tr>
<td>Predictors of alexithymia, controlling for depression and anxiety</td>
<td>74</td>
</tr>
<tr>
<td>Strength of relationship between parental bonding, attachment and</td>
<td></td>
</tr>
<tr>
<td>alexithymia</td>
<td>74</td>
</tr>
<tr>
<td>3.3.3 Relationship between all independent variables and EDI subscales</td>
<td>76</td>
</tr>
<tr>
<td>(with EDI subscales as dependent variable)</td>
<td></td>
</tr>
<tr>
<td>3.4 Post-hoc Analyses</td>
<td>81</td>
</tr>
<tr>
<td>3.4.1 Redefining groups for further analysis</td>
<td>81</td>
</tr>
<tr>
<td>Process of redefining groups for further analysis</td>
<td>83</td>
</tr>
<tr>
<td>Determining cutoff scores on the EDI-2 subscales:</td>
<td></td>
</tr>
<tr>
<td>Drive for Thinness and Bulimia</td>
<td>83</td>
</tr>
<tr>
<td>Rationale for applying a BMI exclusion criterion</td>
<td>84</td>
</tr>
<tr>
<td>3.4.2 Education levels in the new groups</td>
<td>85</td>
</tr>
<tr>
<td>3.4.3 Group differences in alexithymia, controlling for depression and</td>
<td></td>
</tr>
<tr>
<td>anxiety</td>
<td>85</td>
</tr>
<tr>
<td>3.3.3 Group differences in parental bonding</td>
<td>86</td>
</tr>
<tr>
<td>3.4 Subgroup differences in predictors of alexithymia</td>
<td></td>
</tr>
<tr>
<td>4. DISCUSSION</td>
<td>89</td>
</tr>
<tr>
<td>4.1 The origins of alexithymia: implications of insecure attachment</td>
<td>89</td>
</tr>
<tr>
<td>4.1.1 Attachment</td>
<td></td>
</tr>
<tr>
<td>Validity of the PBI and CRQ measures</td>
<td>90</td>
</tr>
<tr>
<td>Insecure attachment style in the eating disorders group</td>
<td>90</td>
</tr>
<tr>
<td>Continuity of attachment</td>
<td>91</td>
</tr>
<tr>
<td>4.1.2 Attachment, alexithymia and sex of parent</td>
<td></td>
</tr>
<tr>
<td>Influence of attachment on alexithymia</td>
<td>93</td>
</tr>
<tr>
<td>4.2 Alexithymia and psychopathology</td>
<td>100</td>
</tr>
<tr>
<td>Psychopathology in the eating disorders group</td>
<td>100</td>
</tr>
<tr>
<td>Higher prevalence of alexithymia in the eating disorders group</td>
<td>101</td>
</tr>
<tr>
<td>4.3 The Relationships between Alexithymia, Depression, and Anxiety</td>
<td>103</td>
</tr>
<tr>
<td>4.4 Education Level and Age as Possible Confounding Variables</td>
<td>106</td>
</tr>
</tbody>
</table>
Table of Contents (continued)

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.5 Alexithymia and Attachment: Relationship with Disordered Eating Themes</td>
<td>108</td>
</tr>
<tr>
<td>4.6 Limitations of this study</td>
<td>111</td>
</tr>
<tr>
<td>4.7 Future directions</td>
<td>114</td>
</tr>
<tr>
<td>References</td>
<td>117</td>
</tr>
<tr>
<td>Appendices</td>
<td>131</td>
</tr>
</tbody>
</table>
LIST OF TABLES

Table 1. Eating Disorders Group and Comparison Group Means and
Standard Deviations for Measures and Subscales..............................63

Table 2. Eating Disorders Group and Comparison Group Means and
Standard Deviations for EDI-2 Subscales...........................................67

Table 3. Pearson Product Moment Correlations between Parental Bonding
Instrument (PBI) and Close Relationship Questionnaire (CRQ)..............71

Table 4. Amount of Variance in EDI-2 Subscale Scores That Can Be Accounted
For By BDI-II, STAI, TAS-20, PBI, and CRQ entered together...............80
LIST OF FIGURES

Figure 1. The two scales of the Parental Bonding Instrument showing the conceptualized parental bonding possibilities.................................................................49

Figure 2. The two hypothesized dimensions of adult attachment that form the basis of the ‘Close Relationships Questionnaire’ ........................................................................52

Figure 3. Age Profile of the Eating Disorders Group versus the Comparison Group ....61

Figure 4. Education Level of the Eating Disorders Group

Versus the Comparison Group.............................................................................61

Figure 5. Ethnicity of Eating Disorders Group Versus Comparison Group..............62

Figure 6. Relationships and beta weights for independent variables: alexithymia, parental bonding, adult attachment dimensions, depression and anxiety, and the EDI-2 subscales. .........................................................................................78

Figure 7. Body Mass Indices of Eating Disorders Group and Comparison...............83

Figure 8. Hypothesised relationships between alexithymia, anxiety, and depression....116
LIST OF APPENDICES

Appendix 1. Information for control group participants .............................................

Appendix 2. Information for control group participants .............................................

Appendix 3. Consent Form .....................................................................................

Appendix 4. Information for Eating Disorder participants ........................................

Appendix 5. Consent Form .....................................................................................

Appendix 6. TAS-20 ..............................................................................................

Appendix 7. Parental Bonding Instrument ............................................................... 

Appendix 8. Close Relationships Questionnaire ......................................................

Appendix 9. State Trait Anxiety Inventory ............................................................... 


Appendix 11. Eating Disorders Inventory – Second Edition ....................................

Appendix 12. EDI-2 Profile form .............................................................................
ACKNOWLEDGEMENTS

I would like to thank my supervisor, Professor Ken Strongman, for his wonderful support and guidance. In my moments of self-doubt Ken was always there with a praise and encouragement. There is no better motivator! I am sure that, at times, I stretched his patience in my indomitable search for unachievable excellence but Ken never once complained about having to wait to see something until I was ready. I very much look forward to continuing to work with him.

I am indebted to Averil Overton of the eating disorders service at The Princess Margaret Hospital who gladly let me to join forces with her in data collection and gave me fabulous clinical guidance. I look forward to continuing our alliance.

I would not have returned to university without the initial prompting and support from my lovely partner, Richard. I thank you Richard for your patience and understanding, but most all for always greeting me with a smile when I get home late!

I owe a big thank you to my good friend Larry Owens who cajoled me along these last few months. Larry was always there when I needed someone to help me out in what, at the time, seemed to be more than the usual number of computer crises. I fear this thesis would never have reached print stage without his help.

Lastly, and by no means least, I would like to thank all the people who participated in this study. I really value the time that was set aside to complete the wad of questionnaires. My special thanks go to the women from the eating disorders service who took part in the study and to whom I dedicate this thesis. I was so very impressed with your interest and eagerness to participate in this project. I only hope that my work will be of some little use in increasing our understanding of eating disorders.
ABSTRACT

A multi-dimensional construct, alexithymia represents a cluster of characteristics: difficulty distinguishing between feelings and the bodily sensations of emotional arousal, difficulty describing feelings, an externally-oriented cognitive style, constricted imaginal processes and paucity of fantasy. Originally developed to describe features observed in psychosomatic patients, it is now thought that alexithymia makes individuals vulnerable to physical and mental illness, including coronary heart disease, inflammatory bowel disease, anxiety disorders, substance abuse disorders, somatoform disorders, and eating disorders. Alexithymia is thought to reflect dissociation or dysfunction in the emotion regulation system resulting from an arrest in emotion development at the preoperational stage.

This study investigated the hypothesis that the origins of alexithymia (i.e. disrupted emotion development) lie in problematic attachment relations. A group of women diagnosed with eating disorders (N = 30) and a comparison group of women of similar age (N = 83) were administered a set of self-report instruments that included the Toronto Alexithymia Scale (TAS-20), Parental Bonding Instrument (PBI), Close Relationships Questionnaire (CRQ), Beck Depression Inventory (BDI-II), State-Trait Anxiety Inventory (STAI), and the Eating Disorders Inventory (EDI-2). With the exception of the externally oriented thinking subscale of the TAS-20, eating disorders group means were significantly higher than comparison group means for subscales of all measures (p < .05). The eating disorders group was more alexithymic, more severely depressed and anxious, and showed patterns of less secure attachment than the comparison group. Alexithymia was shown to covary with education. Anxiety, trait anxiety in particular, and depression could account for elevated alexithymia scores in the eating disorders group. In the whole sample, correlations were revealed between the PBI and CRQ suggesting continuity of attachment, and both attachment measures could predict TAS-20 subscales providing support for the hypothesis implicating attachment in the etiology of alexithymia. All measures predicted EDI-2 subscales, with the most diverse relationships revealed for BDI-2 and TAS-20. An unexpected positive relationship was revealed between PBI paternal care and two of the TAS-20 subscales, difficulty describing feelings and externally oriented thinking. A number of possible explanations are discussed.
1. INTRODUCTION

1.1 Overview

The alexithymia construct is conceptualized as reflecting deficits in cognitive processing and regulation of emotion. People with alexithymia are described as having difficulty with affective self-regulation and may be prone to certain medical, psychiatric, and psychosomatic disorders. A multi-dimensional construct, the primary characteristic of alexithymia is difficulty in identifying feelings and, in particular, a compromised ability to distinguish between feelings and the bodily sensations of emotional arousal. A second, highly related, characteristic is difficulty in describing feelings, including both finding the words and revealing innermost thoughts. A third characteristic is described as a stimulus-bound, externally-oriented cognitive style, while the fourth characteristic relates to constricted imaginal processes and a paucity of fantasies (Taylor, Bagby, & Parker, 1997).

Although there were earlier alexithymia scales, the first instrument that could adequately measure the alexithymia construct was the twenty-six item self-report questionnaire, the Toronto Alexithymia Scale (TAS). The TAS demonstrated a four-factor structure that was theoretically congruent with the alexithymia construct: difficulty identifying and distinguishing between feelings and bodily sensations; difficulty describing feelings; reduced daydreaming; and, externally oriented thinking. While this original scale demonstrated good reliability and validity, over the course of further evaluation, several shortcomings became apparent. High correlation of the first two factors and cross-loading of several items brought the independence of these factors into question, while items assessing the daydreaming factor correlated negatively with the first factor suggesting the items had little theoretical coherency with the other facets of the alexithymia construct. There was also speculation about whether the daydreaming factor was vulnerable to a social desirability response bias, and criticism that daydreaming alone may not capture adequately the capacity for imaginal activities (Bagby, Parker, & Taylor, 1994; Bagby, Taylor, & Parker, 1994).

Revision and reconstruction of the TAS item domains addressed the problems experienced with the original scale and lead to the development of the twenty-item TAS-
This instrument is currently regarded as the best available measure of the alexithymia construct. During this scale's development the authors failed to retain sufficient number of items to reliably measure the imaginal facet of the alexithymia construct and show theoretical coherency with the other components, so they decided to discard this content domain. The final TAS-20 scale, therefore, measures three of the four facets of the alexithymia construct: difficulty in identifying feelings and distinguishing between feelings and the bodily sensations of emotional arousal (Factor 1), difficulty communicating feelings to other people (Factor 2), and externally oriented thinking (Factor 3). The fourth characteristic, constricted imaginal processes and a paucity of fantasies, is retained conceptually as part of the construct but is not measured by the TAS-20 (Bagby, Parker et al., 1994; Taylor, 2000).

It has been hypothesized that the origins of alexithymia lie in interrupted or impaired emotional development resulting from problems in early attachment relationships (Taylor et al., 1997). Qualitatively different types of attachment bond are believed to form as a result of variation in the affective attunement of early caregiving. Appropriately responsive caregiving facilitates secure attachment, and emotion awareness and regulation abilities. Conversely, indifferent, neglectful and/or overcontrolling parenting is implicated in the formation of insecure attachment relationships, and the corresponding emotion deficits that are associated with alexithymia. It is thought that early caregiver-child attachment bonds may form the basis of prototypic representations that influence relationships and emotion abilities throughout the lifespan. There is some evidence suggesting the continuity of attachment style from childhood through to adulthood. To date, though, the developmental link between insecure attachment and the emotion deficits associated with alexithymia has received little research attention.

High rates of alexithymia and insecure attachment have been found, independently, in samples of individuals with eating disorders. However, in this population, the hypothesized relationship between alexithymia and attachment constructs has not been confirmed. Evidence from a parallel line of enquiry suggests that elevated alexithymia scores can be accounted for by the presence of depression and anxiety, both of which have high levels of comorbidity with eating disorders. Empirical support for this proposition is not conclusive. Additionally, very little empirical research has investigated the
relationships between psychological themes associated with eating disorders and the multiple dimensions of alexithymia and attachment. An exploration of these relationships forms the basis of this thesis. The introduction reviews theory and research relevant to the constructs investigated in the study.

1.2 The Alexithymia Construct

1.2.1 The construct defined

The origins of the alexithymia construct can be traced back to clinical observations of psychosomatic patients beginning in the late 1940’s. Until this time, the dominant conceptualization of psychosomatic illness was consistent with Freud’s model of psychoneurotic pathology. However, clinical observations made by some of the early leaders in psychosomatic medicine suggested that intrapsychic conflict was an inadequate explanation for psychosomatic phenomena. For instance, Reusch (1948) noted a disturbance in verbal and symbolic expression among psychosomatic patients and patients with post-traumatic syndromes which he attributed to ‘immaturity’ or the continuation of an ‘infantile personality’ into adult life. Independently, Horney (1952) and Kelman (1952) reported that some of their psychiatric patients responded poorly to psychoanalytic treatment (Horney, 1952; Kelman, 1952). They attributed this to a lack of emotional awareness in these individuals which is not conducive to the success of a psychodynamic approach. They also noticed that these patients were prone to developing psychosomatic symptoms and often suffered from binge eating, alcoholism and other compulsive behaviours which they described as means by which the patients could avoid experiencing feelings of inner emptiness.

In 1949, MacLean observed that his patients were unable to verbalize their feelings and hypothesized that a disturbance in cognitive processing of emotion in some people may predispose them to psychosomatic illness. MacLean used the model of a ‘triune brain’ to explain the phenomenon. The model describes the evolution of a hierarchical brain structure where the brainstem, involved in the regulation of the autonomic, endocrine and instinctive activities, contributes to the experience of emotion. The less primitive limbic system functions as a crude analysing mechanism, deriving information and interpreting
experience of emotional states. The third brain structure, the neocortex, is responsible for cognitive functions, including symbolism, and is referred to by MacLean as the 'word brain'. The neocortex provides enhanced cognitive capacities including higher level mental representations of the external and internal environments and more finely tuned emotional responses. MacLean speculated that instead of being relayed to the neocortex and finding expression in words, distressing emotions are expressed through the autonomic nervous system. This 'physiological expression', if severe and prolonged, may lead to physical disease (MacLean, 1949, 1990).

The term 'Alexithymia', which, translated literally from the Greek, means 'lack of words for feelings', was first coined by Sifneos in 1973 (Sifneos, 1973). In the late 1960's and early 1970's Sifneos and Nemiah had begun to systematically investigate the cognitive and affective style of patients suffering from psychosomatic illness. Their findings confirmed that many patients had great difficulty describing subjective feelings, their conversation featured external events in minute detail, and they experienced an absence of fantasy (Nemiah, Freyberger, & Sifneos, 1976). The term alexithymia was adopted to denote this cluster of cognitive and emotion characteristics.

Since the mid-1970s the alexithymia construct has been refined theoretically, with emphasis, more recently, on validating the construct and developing a reliable measurement system (Taylor, Bagby, Ryan, & Parker, 1990). In the process of achieving this, alexithymia has been implicated in a wide range of physical and psychiatric illnesses, has been found to be continuously distributed in the population, and has been established as a cross-cultural phenomenon (Taylor et al., 1997).

The widely accepted conceptual model for alexithymia presented by Taylor, Bagby and Parker (1997) is founded on several important principles. Firstly, alexithymia and affect regulation are aligned conceptually and placed squarely within the broader principle of self-regulation. Secondly, a triadic, reciprocally-related system of emotion regulation is proposed where emotions are viewed as composite states, importantly including a cognitive-experiential component as well as neuro-physiological and behavioural-expressive components.
In a well-functioning system, cognition is involved in processing and regulating emotion, and emotion plays a critical role in organising cognition and behaviour. Emotion regulation is viewed as a process involving reciprocal interactions between the neuro-physiological, motor-expressive and cognitive-experiential domains of emotion response systems. Activation in any one of these domains modulates activation in the other domains. In the emotion regulation system, emotions may modulate other emotions, for instance, interest may attenuate fear, while social interaction provides for interpersonal regulation of emotion.

Although retaining a preconscious awareness of emotion cues, the alexithymic individual appears to have a limited conscious awareness of emotion states. This characteristic of alexithymia suggests only partial integration of cognitive-experiential components of emotion with neuro-physiological and behavioural-expressive components (Taylor et al., 1997). As part of a larger self-regulating system, it is postulated that the dysregulated emotions that result may alter biological systems and thereby contribute to the development of physical and mental illness.

It is proposed that dysregulation of emotion regulation occurs when the normal emotion development process is disturbed or disrupted. In order to explain this process, the conceptual model of alexithymia presented by Taylor and colleagues (1997) incorporates a framework of emotion development. The latter is based on the model of affect development proposed by Lane and Schwartz (1987), who integrate Piaget’s theory of cognitive development with Werner & Kaplan’s ideas about symbolisation and language development (Werner & Kaplan, 1963). A cognitive developmental model is, thus, devised for understanding the organisation of emotional experience.

Lane and Schwartz (1987) hypothesize that experience of emotion undergoes structural transformation in a developmental sequence. Five levels of emotion organisation and awareness are proposed. Initially, in the sensorimotor reflexive stage which corresponds with early infancy, emotion is experienced only as bodily sensations but may be evident to others in facial expression. During the sensorimotor enactive stage emotion is experienced as bodily sensation and action tendency. The pre-operational stage, at about eighteen months of age, is characterised by emotions being experienced
psychologically as well as somatically but they are uni-dimensional and verbal descriptions of emotion are often stereotyped. Around the age of four years, in the concrete operational stage, the child develops an awareness of blends of feelings and can describe complex and differentiated emotional states that are part of subjective experience. Finally, in the formal operational stage, corresponding with adolescence, the person develops an awareness of blends of blends of feelings as well as the capacity to make subtle distinctions between nuances of emotion and the ability to comprehend the multi-dimensional experience of others (Lane & Schwartz, 1987, c.f. Taylor et al., 1997).

The staged model is used as a framework for conceptualising the development of emotion through childhood into adulthood. The developmental process can explain individual differences in emotion experience, expression, and in the ability to regulate emotion, as well as capacity to empathise. In the context of this hierarchical model of emotional development, alexithymia is believed to reflect a lower, preoperational, level of functioning (Taylor et al., 1997). The pre-operational level of emotional development is characterised by the somatic experience of emotion, and a uni-dimensional cognitive experience that is reflected in stereotyped verbal descriptions of emotion (Lane & Schwartz, 1992). The more refined emotional abilities associated with later developmental processes appear to be absent in individuals with alexithymia. Thus, alexithymic individuals have compromised capabilities with respect to awareness of blends of feelings, the ability to recognize and describe complex and differentiated emotional states, the capacity to make subtle distinctions between nuances of emotion, and the ability to comprehend the multi-dimensional emotional experience of others (Taylor et al., 1997).

1.2.2 Evidence of Disruption in the Emotion System

The features observed in alexithymic individuals suggest dissociation in the emotion system. Empirical evidence supporting this premise validates the construct and the theory that underpins it.

In terms of alexithymia representing an arrest in emotional development, there is empirical evidence suggesting dissociation of cognitive and behavioural components of the emotion system. A rather novel ethological study, reported by Troisi and colleagues
(2000), investigated alexithymia and displacement activities. Displacement activities were defined as self-directed non-verbal behaviours, such as self-touching, scratching, and self-grooming, which were identified as concomitants of increased emotional and physiological arousal. In the study, patients with anxiety or depressive disorders were video-recorded during psychiatric interviews. Patients with more pronounced alexithymic features showed a consistently higher frequency of displacement activities during interviews, even though levels of self-rated anxiety and depression were equivalent to those reported by non-alexithymic patients. This was interpreted as a failure of alexithymic patients to regulate cognitively distressing emotions, resulting in increased displacement behaviour in these individuals. The authors suggest that the dissociation between cognitive appraisal of emotion and non-verbal behaviour reflecting increased emotional arousal supports the view that alexithymia implies a failure to elevate emotions from a preconceptual level of organization to the conceptual level of mental representations (Troisi et al., 2000).

An earlier study was conducted with a non-patient group of adults free of situational anxiety and depression (Troisi, Chiaie, Russo, Mosco, & Pasini, 1996). Individuals who scored highly on the alexithymia factors difficulty identifying feelings and difficulty describing feelings showed poor non-verbal expressivity and frequent self-directed behaviour patterns suggestive of tension and anxiety. Individuals with a tendency toward the third factor, externally oriented thinking, showed more avoidance behaviour during the interview. The authors concluded that their findings provide support for clinical observations that alexithymic traits interfere with processing of emotions and interpersonal behaviour (Troisi et al., 1996). These findings also suggest that the various alexithymia factors may reflect dysfunction in different parts of the emotion system.

Investigation of the physiological features of alexithymia is central to the alexithymia construct in terms of providing evidence of dysfunction of the emotion system. Empirical research on the physiological aspects of alexithymia, however, is limited and findings have been inconsistent. Alexithymic individuals have been shown to have higher tonic levels of sympathetic arousal than non-alexithymic individuals (Fukunishi, Sei, Morita, & Rahe, 1999), as well as demonstrating a decoupling of the autonomic and cognitive responses to stressors (Papciak, Feuerstein, & Spiegual, 1985; Martin and Pihl, 1986). The findings of two further studies suggest that alexithymia is related to an elevated baseline heart rate
(Papciak et al., 1985; Wehmer et al., 1995). In contrast, Friedlander and colleagues (1997) found that, although alexithymic subjects had greater tonic electrodermal activity and reported more arousal and displeasure to stressors, they did not differ from non-alexithymic subjects in either tonic heart rate or blood pressure, or in reactivity and recovery. In a relaxation exercise, alexithymic subjects reported less enjoyment and involvement and poorer imagery but they did not vary in the degree of physiological relaxation compared with non-alexithymic individuals (Friedlander, Lumley, Farchione, & Doyal, 1997).

Like a number of investigators, Friedlander and colleagues (1997) found higher tonic sympathetic arousal (in this case, evidenced by higher tonic electrodermal activity) in alexithymic individuals but their results do not support the unregulated physiological response to stressors that is suggested by descriptions of the alexithymia construct. The current conceptualization of alexithymia associates the construct with an inability to modulate emotion through cognitive processing due to underlying impairment in emotion processing and emotion regulating capacities (Taylor et al., 1997, p31). However, instead of a failure to cognitively regulate emotion, the findings of studies such as that of Friedlander and colleagues' might be better described as a ‘calibration’ type issue that seems to differentially affect the various aspects of sympathetic nervous system functioning. Regarding the neuro-physiology of alexithymia, the exact nature of the phenomena has yet to be adequately defined.

With respect to cognitive-experiential deficits, such as emotion understanding, there is evidence associating alexithymia with impaired recognition of both pleasant and unpleasant emotions (Lane, Sechrest, Riedel, Shapiro, & Kaszniak, 2000). As regards emotion- and self-regulation, alexithymia has been linked to an inability to modulate painful affective states (Krystal, 1977, 1979), as well as deficits in self-care, and lower life satisfaction. In a study involving over 500 students, individuals with alexithymia reported using more negative strategies to modulate affect and they were less satisfied with life. An indirect pathway was identified between alexithymia and life satisfaction, mediated by negative affect regulation and by self-nurturance (Schmitz, 2000).
Drawing from clinical observation and research, the cognitive-experiential and behavioural-expressive emotion deficits associated with alexithymia are fairly well documented. There is growing empirical evidence in support of alexithymia as a disruption in the emotion regulation system. Theoretically and empirically, however, the neuro-physiological component of the alexithymia construct has been less well explored and, as a result, is the weakest link. If the relationship between alexithymia and dysregulation of the emotion system (and the physiological component of emotion, in particular) was better established through empirical research, then it would add to the validity of the alexithymia construct and might also help explain the hypothesized relationship between alexithymia and medical and psychiatric disorders.

1.3 The Origins of Alexithymia

1.3.1 Caregiver Involvement in Emotional Development

An organizational-developmental perspective conceptualises emotion regulation development as a process of increasing differentiation and hierarchical integration of biological and psychological systems (See, for example, (Shields & Ciccetti, 1997). Emotion regulation in infancy is characterised by a dependency on the caregiver for regulation of affect. Emotion regulation strategies, described as behaviours used to regulate emotional experience, are believed to become more complex and sophisticated with age as cognitive, including attentional and symbolic, processes develop (Grohnick, Bridges & Connell, 1996).

Thompson (1994) noted that there are individual differences in emotion response with variation in the intensity, persistence, modulation, onset and rise time, range, and lability of, and recovery from, emotional responses (Thompson, 1994). He postulated that the source of individual differences in emotional responsiveness, and, by implication, emotion regulation, may derive in part from coping strategies acquired in the context of the caregiving relationship (Thompson, 1988). Cassidy (1994) takes a similar approach, stating that emotion regulation involves a mix of intrinsic (such as temperament) and extrinsic (such as relationship with parents) factors.
Thus, prominent developmental psychology theorists agree that it is largely within the parent-child relationship that children learn about emotion regulation. Parents guide their children's learning, helping them select and employ an emotion response option that will be most effective for attaining their immediate goals in a given situation. The development of emotion regulation is enhanced by increased access to coping resources, both material and interpersonal. As development proceeds, the child's sourcing of external support in order to regulate emotion becomes more planned and strategic. With increasing age, the expression of emotion also begins to be channeled in directions that the emotion culture finds acceptable. This process is facilitated by the socialisation practices of parents (Cassidy, 1994). Additionally, individual differences in parent's own attachment representations may be associated with distinct styles of emotion regulation that entail minimising or enhancing different emotions in interaction with their offspring (Cassidy, 1994).

Importantly, the developing complexity of the child's coping resources and emotion regulation strategies is likely to be enhanced or limited by the quality of early attachment relationships with parents. Given the role of the attachment figure as an external coping resource and mentor of emotion regulation strategies, then, clearly there are negative implications for unresponsive parenting. For instance, the development of emotion regulation is undermined when the range of response possibilities is restricted or when existing regulation strategies are perceived to lead consistently to undesirable outcomes (Thompson, 1994).

### 1.3.2 Attachment relationships and emotion development

The preoperational level of emotion organization associated with alexithymia corresponds, developmentally, with the period when attachment bonds are being formed. It is no coincidence that the model of alexithymia places particular emphasis on the parent-child relationship in the etiology of alexithymia (see, for example, Taylor et al., 1997). It has been proposed that, in the context of a secure attachment relationship, affective communication is reinforced, facilitating the integration of the somatic experience of emotion with cognitive information, and providing practice in the use of cognition to moderate emotions and in the use of emotion to inform cognition (Crittenden, 1994).
Parental bonding problems or insecure attachment lead to failure to integrate cognition with emotion, resulting in the characteristics of alexithymia.

Consistent with the view that subtypes of insecure attachment exist with differing characterizations, Crittenden makes a distinction between avoidant and ambivalent insecure attachment. Insecure-avoidant attachment leads the individual to distrust emotion-based information and they come to rely on cognition to organise their behaviour and control emotion. An insecure-ambivalent attachment style is associated with a distrust of cognitively based information and these individuals function on the basis of unregulated emotion (Crittenden, 1994).

The links between the parent-child relationship, attachment and emotion regulation style proposed by Crittenden are fairly well substantiated. Research on attachment styles in infancy has identified that the primary caregiver’s sensitivity and responsiveness to the infant’s emotional states is a major determinant of the child’s developing self-regulation of emotion as well as how the child relates to others (Bretherton, 1985; Goldberg, MacKay-Soroka, & Rochester, 1994).

In summary, parents’ attunement to infant emotion signals and their ability to contain and transform primitive emotions facilitates the establishment of an interpersonal affect-regulating system. The latter evolves gradually into a capacity to self-regulate emotions as the child learns to identify, distinguish and label their emotions. An unresponsive parenting style, or infantile trauma, might interfere with and arrest emotional development at the preoperational stage. This would lead to the deficits in emotion regulation associated with alexithymia.

1.3.3 Continuity of attachment

Given that the construct positions alexithymia as having relative temporal stability, and attachment is implicated in the origins of alexithymia, one might also expect some degree of continuity in attachment. As a construct, attachment was initially developed to explain individual differences in the emotion response of infants on separation and reunion with their mother. The primary caregiver’s sensitivity and responsiveness has been
identified as a major determinant of how the child relates not just to caregivers but also to others (Bretherton, 1985; Goldberg, MacKay-Soroka, & Rochester, 1994). According to Bowlby’s (1977) theory, children internalize their experience with caregivers so that early attachment relations form a prototype for later relationships outside the family (Bowlby, 1977). Stability of attachment through childhood has been demonstrated by many studies, and is usually established by applying Ainsworth’s strange situation procedure in infancy, then reassessing the sample some months and even years later (Bartholomew, 1990). These studies have demonstrated high rates of stability, particularly in upper-middle class families, with as many as 96 per cent of infants being classified in the same attachment category over a six month period (Waters, 1978).

In order to be consistent with the conceptualization of prototypic attachment styles in infancy and early childhood (reinforced by a huge volume of research), initially, adult attachment models built on Ainsworth’s categorical conceptualization of infant attachment patterns. Hazan and Shaver’s (1987) influential work on adult romantic attachment, for instance, incorporated Ainsworth’s three attachment categories as a framework for conceptualizing individual differences in the way adults think, feel, and behave in intimate relationships (Hazan & Shaver, 1987).

Extending the work of Hazan and Shaver (1987), Bartholomew and Horowitz (1991) developed their model of adult attachment by building on Bowlby’s (1977) theory that early childhood attachment experiences are internalized in the form of working models of ‘self’ and ‘others’. They dichotomized these two variables to form a 2 x 2 matrix (models of self x models of others) of prototypic adult attachment styles. They proposed that models of self can be either positive or negative (worthy and lovable, or, not worthy and unlovable), and that models of others can be either positive or negative (trustworthy and available, or, untrustworthy and unavailable). Four adult attachment styles emerge from this matrix that they label ‘secure’, ‘preoccupied’, ‘dismissing-avoidant’, and ‘fearful-avoidant’. Secure attachment reflects positive self and other working models, while insecure attachment, divided into the three prototypes, reflects combinations of positive and/or negative representations of self and others. These adult attachment styles described by Bartholomew and Horowitz also correspond with the secure, anxious-ambivalent,
anxious-avoidant and disorganized attachment patterns in childhood that have been described by Ainsworth (Ainsworth, Blehar, Waters, & Wall, 1979).

With regard to continuity of childhood attachment style into adulthood, the relative recency of adult attachment concepts and corresponding measures has precluded the extended longitudinal study required to establish long term stability. The findings of cross-sectional studies suggest that the proportions represented by each attachment category appear to be similar in adult and child samples (Baldwin & Fehr, 1995), which implies continuity. However, without evidence from longitudinal study, the stability of attachment may be overestimated since it may be the proportions, and not the classification of the individual subjects on which they were based, that remained stable.

Reviewing their findings from six studies conducted over a two year period, Baldwin and Fehr (1995) reported an overall rate of change in attachment style of 28 per cent (Baldwin et al., 1995). Rates of change, however, appear to vary as a function of the instrument and attachment model employed. For instance, rates of change in attachment classification were significantly different using the four category measure (Bartholomew, 1990), but were not found to differ significantly in studies that used a three category measure (Hazan et al., 1987). An explanation for the temporal instability in attachment orientation is offered by Baldwin and Fehr (1995), who suggest that an individual’s attachment style may be unique to the situation and person with whom it is being applied. In short, an individual may employ a range of attachment styles, depending on the nature of the activating environment. Presumably, an individual might exhibit a predominant pattern of attachment orientation, since attachment experiences are cognitively organized and will be reflected in core schema. With regard to using adult attachment measures, Baldwin and Fehr (1995) suggest that researchers classify subjects based on self-reports administered concurrently with other measures, and report results in terms of the individual’s ‘current attachment status’.
1.3.4 Reconceptualisation of adult attachment as dimensional and continuously distributed

In recent years, the typological conceptualization of attachment such as that proposed by Hazan and Shaver (1987) and Bartholomew and Horowitz (1991) has been questioned. It has been suggested that a dimensional approach might be more representative (e.g. Simpson & Rholes, 1998), and there is growing empirical support for such a conceptualization. Recently, Fraley and colleagues conducted an item response analysis using over 400 items from a collection of available adult attachment instruments (Fraley, Brennan, & Waller, 2000). They demonstrated that the item responses grouped into thematically similar clusters of statements, and factor analysis revealed two dimensions that they termed avoidance and anxiety. Importantly, their item response analysis supported continuous distribution rather than a prototypic pattern of adult attachment.

The shift from a categorical to dimensional conceptualization has obvious implications for research as well as theory development. According to Fraley and Waller, for instance, the use of categorical measurement models in assessing continuously distributed constructs seriously undermines reliability, validity, and statistical power (Fraley & Waller, 1998). According to Brennan and colleagues, “attachment prototypes or categories are not real, ultimately only the dimensional scores matter” (Brennan, Clark, & Shaver, 1998, p 61). Thus, the grouping of scores to make attachment types may not only be misrepresentative but misleading.

1.4 Parental Care as a Determinant of Attachment Style

A number of attempts have been made to define specific characteristics of the caregiving environment that are critical to the attachment process. An established and empirically supported conceptualisation proposes that the early care-giving environment is characterized by key parenting\(^1\) style dimensions of care and overprotection (Parker, Tupling, & Brown, 1979). The care dimension is defined at one pole by affection, emotional warmth, empathy, and closeness, and at the other end by emotional coldness,

---

\(^1\) The terms ‘parenting’ and ‘caregiving’ are used interchangeably in the literature: parenting has been retained to be consistent with original literature and research.
indifference, and neglect. The overprotection dimension is defined by control, overprotection, intrusion, excessive contact, and prevention of independent behaviour at one pole, and at the other by the allowance of independence and autonomy. A high-low continuum for the care and overprotection dimensions allows five types of parental bonding to be examined, including: average (defined statistically), high care and low overprotection, high care and high overprotection, and so on. Parker’s (1979) work on parental bonding was conducted in the context of Bowlby’s (1977) and Ainsworth’s (1979) theories of attachment and, hence, the dimensions of parental bonding appear to have conceptual synergy with attachment categories.

The combination of high-care and low-overprotection parenting constitutes a supportive environment for the child and is believed to facilitate the development of optimal parental bonding. The high level of parental care, including emotional closeness and affective responsivity, ensures that the infant’s needs are appropriately met, while a low level of overprotection promotes healthy independence and autonomy that are likely to contribute to a sense of self-efficacy. Integrating parental bonding with attachment theory, this conceptualisation is consistent with that of Ainsworth’s model, where the formation of secure attachment depends on the provision of a ‘secure base’ from which the child feels it may safely venture to explore the world (Ainsworth et al., 1979). Following the attachment pattern through to adulthood, Bartholomew (1991) defines secure attachment in terms of positive representations of self and others. The adult with a secure attachment style is, therefore, likely to find it relatively easy to become close to others emotionally, and feel comfortable depending on others and having others depend on them.

A low-care, low over-protection, care-giving environment (conceptualized as absent or weak bonding by Parker) is likely to promote feelings of autonomy, independence and self-efficacy in the infant but, due to the child’s experience of emotional coldness and unresponsiveness in the caregiver, it may result in low levels of trust in the dependability of others. This description corresponds with Ainsworth’s ‘anxious-avoidant’ infant attachment style (Ainsworth, Blehar, Waters, & Wall, 1978), and the ‘compulsive self-reliant’ adult pattern identified by Bowlby (1977). In terms of more recent adult attachment classification, based on self-other representations, this would equate to Bartholomew’s ‘dismissing’ prototype (Bartholomew and Horowitz, 1991). In adulthood,
the dismissing-attached person may be suspicious of others, be comfortable without close relationships and opt for a more independent, self-sufficient lifestyle. They may feel uncomfortable in situations that require them to be dependent or reliant on others, and in situations that demand that others depend or rely on them.

In contrast, a low-care, high-overprotection care-giving environment (conceptualized as affectionless control) is likely to promote a sense of low self-efficacy and personal unworthiness due to overbearing parenting and lack of experience of self as capable. This would combine with the child’s experience of others as unresponsive and rejecting, and might result in reluctance to trust or depend on others. This description equates with Ainsworth’s disorganized-disoriented attachment pattern. Bartholomew and colleagues would call this the ‘fearful’ prototype. According to Bartholomew and Horowitz (1991), the individual with this attachment style is likely to feel uncomfortable with emotional closeness to others in a qualitatively different way to that of the dismissing-attached individual. In contrast with the latter, they are likely to desire intimacy but feel uncomfortable in close relations due to a sense of personal vulnerability and a pathological worry that they will be hurt if they allow themselves to become too close to others.

Finally, the combination of high care and high over-protection in parenting style (conceptualized as affectionate constraint) might result in experience of others as emotionally available and dependable but controlling, overprotective and restricting. This may cultivate beliefs that self is incapable and ineffective, that, in combination with positive views of others, could result in high levels of dependence on others for self-validation and an insatiable desire for closeness with others. Ainsworth (1979) noted that, after a period of separation, some children could not be easily calmed on reunion with attachment figures. She classified these children as anxious-ambivalent. The corresponding adult attachment style has been termed ‘preoccupied’ by Bartholomew and Horowitz (Bartholomew et al., 1991). In adulthood, the preoccupied-attached individual desires emotional closeness in relationships but finds that others are reluctant to get as close as they would like. They worry that others value them much less than they value others, and, based on fear of being negatively evaluated by others, the resulting anxiety is expressed in approval-seeking behaviour and a need for constant reassurance from their partner(s) that they will not be abandoned.
A substantial body of research testifies to the impact of the family environment on the child’s emotional development. Dunn and Brown (1994) for instance, have demonstrated a link between a poor understanding of emotions in adulthood and the experience of growing up in a family in which negative emotions were frequently expressed (Dunn & Brown, 1994). It has also been noted that people from families low in emotional expression tend to be less spontaneous in their emotions and to convey their emotions in conversation less clearly than do people from highly expressive families (Halberstadt, 1986).

Very little research has been dedicated to identifying the specific environmental factors associated with the development of alexithymia. What little research there is in this area tends to rely on retrospective self-report of the family environment. Dimensions of family environment that have been implicated in the development of alexithymic tendencies include the family’s level of cohesion, expressiveness, conflict, disengagement, sociability, enmeshment, organization, and parenting style. In one of the early studies in this area, Berenbaum and James (1994) found that alexithymia was moderately correlated \((r = .59)\) with a family environment in which members rarely express positive feelings (Berenbaum & James, 1994).

Another, more recent, study investigating these factors found that the sole family variable independently predictive of global alexithymic tendencies was ‘expressiveness’, which was described as concerning the extent to which family members are allowed and encouraged to express their opinions and feelings to each other. Other family variables were predictive of the individual components of alexithymia, with the pattern of correlates varying across the TAS-20 subscales (Kench & Irwin, 2000). This suggests that the three factors of the TAS-20 may be differentially predicted by various aspects of the childhood family environment. Due to the small sample size, the authors were reluctant to engage in detailed speculation about the differential role that aspects of childhood family environment might have in the development of each dimension of alexithymia.
1.4.1 Evidence linking alexithymia with attachment and parental bonding

A number of recent studies have examined the relationship between alexithymia and adult attachment style, and several have examined alexithymia and characteristics of early parental care. However, to date, few studies have simultaneously investigated the relationships between all three variables: alexithymia, dimensions of parental care in childhood, and dimensions of adult attachment. Additionally, researchers in this area have tended to measure these constructs using prototypic and absolute methods, consequently, analysis and findings are almost always reported in categorical terms.

Attachment relationships have been shown to correlate with alexithymia and with the related construct, emotional intelligence (Taylor, 1999). Specifically, insecure attachment styles have been found to positively correlate with alexithymia, and, compared with secure attachment, show different relationships with the alexithymia subscales. For instance, an insecure-dismissing attachment style has been associated with a high alexithymia total score, as measured by the TAS-20 (Bagby, Taylor et al., 1994; Taylor, 1997), and, in particular, with higher scores on the ‘externally oriented thinking’ subscale. In contrast, secure attachment has been found to be significantly negatively correlated with ‘difficulty identifying feelings’ and ‘difficulty describing feelings’ subscale scores of the TAS (Scheidt et al., 1999).

One study of attachment, empathy, and alexithymia in college students found that the degree of fearful attachment style was positively correlated with alexithymia (Posner, 2000). A fearful attachment style has also been associated with maladaptive emotion regulation styles, and, importantly, high personal distress, while a preoccupied attachment style has been associated with a heightened awareness and vulnerability to negative emotions in others (Bekendam, 1997).

In a study of college students, both secure- and fearful-attached individuals were found to have significantly more complex, differentiated and integrated representations of self and others. In comparison, preoccupied- and dismissing-attached individuals were found to employ more maladaptive affect regulation strategies. To regulate negative internal states, preoccupied- individuals revealed a tendency towards oral-somatic and self-
injurious behaviours, while dismissing-attached individuals reported a tendency towards using sex, drugs, and violent fantasy and behaviours. In support of the anxious and avoidant dimensional conceptualization of adult attachment, fearful-attached individuals (equating with high anxiety and avoidance) were more likely to suffer an interpersonally-based depression, while preoccupied-attached individuals (equating with high anxiety and low avoidance) were more likely to suffer anaclitic-type depression (Levy, 2000).

There is also empirical support for an association between retrospectively-reported childhood experience of parenting, in terms of level of ‘care’ and ‘overprotection’, and alexithymia in adulthood. For instance, in a sample of adults with lumbar pain, sub-optimal bonding to caregivers that was characterized by combinations of low care and low overprotection, or low care and high overprotection, was associated with higher levels of alexithymia. In contrast, a parenting style characterized by high care and low overprotection, which is identified as requisite for optimal parental bonding, was associated with lower levels of alexithymia (Huston, 1997).

In one study, Japanese college students were asked to rate the care they had received from their mothers in childhood. Level of care was found to be negatively correlated with total alexithymia and with the difficulty describing feelings factor (Fukunishi et al., 1997). In another study, an association was identified between retrospective reports of feeling unsafe physically and emotionally in childhood and alexithymia in adulthood (Berenbaum et al., 1994), which implies that abusive or extremely negative experiences of caregiving in childhood might lead to alexithymic characteristics.

Maternal care has also been implicated in differences in sympathetic nervous system functioning measured by cardiac activity, as well as in the development of alexithymic characteristics (Fukunishi et al., 1999). In this study, during a resting period, the low frequency (LF)/high frequency (HF) ratio, as an index of sympathetic activity, was significantly higher for students with high total alexithymia scores and scores for the difficulty identifying feelings factor than those with low alexithymia scores. During stress, however, the LF/HF ratio was higher for students with low scores on alexithymia than those with high scores. This suggested that alexithymic students tended to show high sympathetic activity at rest and lower reactivity. The significant association between
alexithymia and sympathetic activity during the resting period was controlled for by the level of mothers care, suggesting that mother's care in infancy and/or childhood may play an important role in the development of alexithymic characteristics and/or heightened sympathetic activity during the resting period (Fukunishi et al., 1999).

In summary, while the findings of individual studies are not conclusive, collectively, the evidence points towards an association between sub-optimal parental bonding and elevations in alexithymia, and insecure attachment and elevations in alexithymia. Only one study links all three constructs, via measurement of sympathetic nervous system activity.

1.5 Eating Disorders: Description of Anorexia Nervosa and Bulimia Nervosa

Alexithymia has been associated with a wide range of mental disorders, including anxiety disorders (particularly post-traumatic stress disorder and panic disorder), substance abuse, and somatoform disorders. The highest levels of alexithymia, however, have been found in samples of eating disorder patients (Bourke, Taylor, Parker, & Bagby, 1992), which makes this an ideal population in which to study alexithymia.

According to the Diagnostic and Statistical Manual of Mental Disorders Fourth Edition (DSM-IV: American Psychiatric Association, 1994), eating disorders are characterized by severe disturbances in eating behaviour. There are currently two specific diagnoses, anorexia nervosa and bulimia nervosa.

Anorexia nervosa is characterized by a refusal to maintain a minimally normal body weight. Two subtypes of anorexia nervosa are defined: individuals with restricting type accomplish weight loss mainly through dieting, fasting or excessive exercise, while individuals with binge-eating/purging type regularly engage in binge eating and/or purging. A serious illness, during which continuous dieting and concomitant weight loss usually lead to an endocrine disorder and often lead to major medical complications, anorexia nervosa usually follows a prolonged course and is associated with high morbidity.
Bulimia nervosa is characterized by repeated episodes of binge eating in which the individual consumes a large amount of food and experiences a loss of control, followed by inappropriate compensatory behaviours such as self-induced vomiting, misuse of laxatives, diuretics or other medications, fasting, or excessive exercise. The DSM-IV defines two subtypes of bulimia nervosa that involve inappropriate use of different compensatory behaviours. The individual with purging type engages in self-induced vomiting and/or abuse of laxatives or diuretics, while the individual with non-purging type engages in excessive exercise and/or fasting. In contrast to anorexia nervosa, individuals with bulimia nervosa are usually normal weight, although a subgroup is overweight. A disturbance in perception of body shape and weight is an essential feature of both anorexia nervosa and bulimia nervosa diagnoses.

An ‘eating disorder not otherwise specified’ (EDNOS) diagnosis is made for individuals with disorders that do not meet criteria for a specific eating disorder. Currently, the DSM-IV Appendix includes ‘binge eating disorder’ as an example of an ‘eating disorder not otherwise specified’, and a diagnosis requiring further study. Binge eating disorder is characterized by recurrent binge eating episodes accompanied by a sense of distress. In contrast to bulimia nervosa, individuals with binge eating disorder do not regularly attempt to prevent weight gain by engaging in purging behaviours, excessive exercise, or fasting.

Both anorexia nervosa and bulimia nervosa typically follow a chronic, frequently relapsing course and often lead to medical complications that sometimes result in death. It is estimated that between 5 and 22 per cent of patients with eating disorders die from medical complications or commit suicide (Bruch, 1971; Deter & Herzog, 1994). Prevalence of anorexia nervosa and bulimia nervosa is between 1 and 2 per cent among adolescent and young adult females, which is the population most at risk of developing eating disorders. However, milder forms of these disorders are believed to occur in approximately 5 per cent of the female population, and bulimic symptomatology may be reported by as many as 10 to 15 per cent of high school and college age females (Drewnowski, Yee, & Krahn, 1988; Drewnowski, Yee, Kurth, & Krahn, 1994; Fairburn & Beglin, 1990). Disordered eating attitudes and behaviours are considered, by many, to exist on a continuum, with pathological eating disorders representing the extreme. There is
remarkable heterogeneity in eating disorders. Additionally, individuals with eating disorders are frequently observed to have fluctuating symptom presentation in clinical settings, and changes in diagnosis (for instance, from anorexia to bulimia) are not uncommon.

1.5.1 Etiology of eating disorders

Very little is known about the causes of anorexia nervosa and bulimia nervosa, despite the huge volume of research that has amassed over the last twenty years or so. Most clinicians and researchers believe in a multifactorial etiology that involves integration of biological, psychological, familial, and socio-cultural variables and vulnerabilities. In terms of family factors, anorexia nervosa has been linked to over-intrusive parenting which is hypothesized to lead to disrupted identity formation and lack of belief in personal effectiveness (Selvini Palazzoli, 1971). In this conceptualization, the symptoms of anorexia nervosa are viewed as an attempt by the individual to establish control through restricting food intake and excessive weight control.

Risk factors for the development of bulimia nervosa have been described as best attributed to a combination of genetic and environmental factors. In their investigation of the genetic epidemiology, Kendler and colleagues (1991) found that perceptions of low paternal care, low self-esteem, high neuroticism, and external locus of control were characteristics associated with the disorder as well as body and weight issues including history of considerable fluctuations in weight, excessive dietary restraint and exercise, a slim ideal body shape, and birth after 1960 (Kendler et al., 1991). Bulimia nervosa has also been linked with a disorganized and chaotic family life where the parents are poorly attuned to the needs of the child (e.g. Bruch, 1971). This is hypothesized to lead to dysregulated emotions and impulsivity. The binge symptoms of bulimia nervosa are viewed as episodes of dyscontrol, perhaps precipitated by, or in an attempt to regulate, negative emotional states, that are followed by behaviours directed at compensating for over-eating.

Clinically, some of the characteristics of individuals with eating disorders are reminiscent of the features of alexithymia. Bruch (1973) was the first clinician to describe
the inability of eating disorder patients to perceive internal stimulation; in particular she observed that anorexia nervosa patients had difficulty distinguishing between bodily sensations and the inner qualities of emotions. She labeled this capacity ‘interoceptive awareness’ (Bruch, 1973). Some therapists have noted that patients with bulimia nervosa often have difficulty identifying the specific emotional states associated with their binge-purge episodes (Goodsitt, 1983). The features of alexithymia have been linked with body image distortion, one of the defining characteristics of the eating disorders. For instance, Krystal (1977) postulated that, since the alexithymic woman is unable to put emotions in adequate words, she cannot use them as signals to herself. Effectively, therefore, she does not really experience the meaning of emotions and her reactions to them are basically somatic. Confusing emotional and somatic signals she is likely to get a distorted image of her body (Krystal, 1977).

Object relations theory, applied to eating disorders, indirectly implicates emotion awareness and emotion regulation. In this conceptualization, a connection is theorized between an individual’s coherent affect world and the ability to satisfy self-object needs, such as self-comfort, self-esteem and affect modulation. It has been proposed, for example, that women with bulimia nervosa lack the emotional awareness necessary for the fulfillment of self-object needs, with the result that they turn, instead, to controllable objects such as food for comfort (see, for example, Bruch, 1973; Tricholo, 1998).

1.5.2 Alexithymia and eating disorders

High rates of alexithymia are found in eating disorder populations (De Groot, Rodin, & Olmsted, 1995; Taylor, 1996). The highest rate of alexithymia found in eating disorders is 77 per cent, reported by Bourke and colleagues, for anorexia nervosa patients completing the TAS (Bourke et al., 1992). More recently published rates range from 48 to 63 per cent for samples of patients with anorexia nervosa, and from 40 to 63 per cent in patients with bulimia nervosa (Bourke et al., 1992; Cochrane, Brewerton, Wilson, & Hodges, 1993; De Groot et al., 1995; Jimerson, Wolfe, Franko, Covino, & Sifneos, 1994; Schmidt, Jiwany, & Treasure, 1993). All of these studies used the original TAS. Using the revised TAS-20 and a lower cut-off score of 55, Corcos and colleagues found that 56 per
cent of the anorexic group, 49 per cent of the bulimia group, and 12 per cent of the control group were alexithymic (Corcos et al., 2000). Taylor and colleagues, using a cut-off of ≥ 61 on the TAS-20, found that 69 per cent of an anorexic group and 11 per cent of an unmatched comparison group were alexithymic (Taylor, 1996).

With respect to absolute levels of alexithymia, the literature is consistent in reporting elevations in alexithymia in eating disorder populations (Cochrane et al., 1993; De Groot et al., 1995; Jimerson et al., 1994; Schmidt et al., 1993; Taylor, 1996). Most of the published research of alexithymia in eating disorder samples has tended to use the original TAS which has more items and a higher cut-off score than the TAS-20. However, two studies that used the TAS-20 report mean scores of 56 (Corcos et al., 2000) and 64 (Taylor, 1996) for anorexic samples, and 49.5 for a bulimic sample (Corcos et al., 2000). There is no normative data available for the general population, but mean scores of 40 (Rastam, Gillberg, Gillberg, & Johansson, 1997) and 43 (Taylor, 1996) have been reported for control participants.

Research has also provided some evidence of differences in level of alexithymia between eating disorder subtypes. Compared with control subjects, TAS score elevations have been found in anorexic women (Bourke et al., 1992; Schmidt et al., 1993; Troop, Schmidt, & Treasure, 1995) and in bulimic women (Cochrane et al., 1993; De Groot et al., 1995; Jimerson et al., 1994; Schmidt et al., 1993; Troop et al., 1995). A number of these studies, using the TAS or TAS-20, have shown that anorexic patients are more alexithymic than patients with bulimia, and eating disorder patients are more alexithymic than control subjects (Cochrane et al., 1993; Schmidt et al., 1993), although differences between eating disorder subtypes are not always significant (Troop et al., 1995). Studies that failed to find differences between eating disorder samples and control subjects have tended to use other measures for alexithymia such as speech samples (Engel & Meier, 1988), or the Minnesota Multiphasic Personality Inventory alexithymia subscale and Rorschach tests (Pierloot, Houben, & Acke, 1988).

The first study to analyse the factor structure of the original twenty-six item TAS in patients with eating disorders was reported by Troop, Schmidt and Treasure (Troop et al., 1995), who found that the scale produced a four-factor solution that reflected the factor
structure of the scale. Importantly, they also analysed the individual TAS subscales and found that, compared with the control group, the eating disorder groups had significantly higher scores on 'inability to identify feelings', but did not differ from each other. The anorexia-restricting subtype group scored higher on the 'paucity of fantasy' subscale than the bulimia nervosa group and comparison subjects. While group differences on the 'difficulty in communicating feelings' subscale did not reach significance, the authors reported that anorexia-restricting and anorexia-bulimic subtypes scored higher than bulimia nervosa and control groups. The 'concrete thinking' subscale, which equates with the externally oriented thinking subscale of the TAS-20 did not differentiate the groups (Troop et al., 1995).

Where high rates of alexithymia have been found in eating disorder populations, the presence of other psychological characteristics suggests emotion regulation and emotion experience deficits that may be specific to an eating disorder diagnosis. Smith and colleagues were somewhat surprised to find that subjects with eating disorders actually used more emotional words than controls, but employed alternative strategies to avoid empathizing (Smith, Amner, Johnsson, & Franck, 1997). They interpreted these results as indicating a pronounced incapacity for emotional understanding among subjects with eating disorders. Indeed, anorexic women with higher levels of alexithymia have been found to use less spontaneous expression of inner cognition and affective experience (Greenberg, 1999). The study by Greenberg (1999) also found that a self-reported problem in interoceptive awareness was positively correlated with alexithymia. It is unclear, however, whether the latter finding is simply a result of conceptual overlap in scale items since both the TAS-20 and the Eating Disorders Inventory – second edition (EDI-2) used in this study use the same questions to measure interoceptive awareness.

Although alexithymia is, measurably, a multifaceted construct, alexithymia subscale score patterns are reported rarely. Therefore, many of the earlier studies, reporting findings using only total TAS-20 score, have limited interpretive strength. As a multidimensional construct, the total alexithymia score may disguise underlying patterns of alexithymia deficits that distinguish eating disorder subtypes.
A few studies have found differences in the pattern of subscale scores between eating disorder groups. For instance, in one study of eating disorder patients, Sexton and colleagues (1998) found that, after controlling for depression, the TAS factor of ‘difficulty in communicating feelings’ remained significantly different between groups, with the anorexia nervosa-restrictors (AN-R) having significantly higher scores than controls or bulimia nervosa patients (Sexton, Sunday, Hurt, & Halmi, 1998). In this study, though, the level of depression and the presence of avoidant personality disorder were the most predictive variables for the alexithymia total score.

Another study that examined the factor structure of the TAS in a sample of female patients with eating disorders, found that, compared with the control group, all eating disorder groups, including anorexia nervosa-restricting type, anorexia nervosa-bulimic type, and bulimia nervosa, had elevated total alexithymia scores and, in particular, much higher ‘difficulty in identifying feelings’ subscale scores (Troop et al., 1995). The individuals diagnosed with anorexia nervosa – restricting type, though, were reported as having a significantly more restricted fantasy life. The authors concluded that components of the alexithymia construct act differently in anorexia nervosa and bulimia nervosa subjects.

1.5.3 Family factors, attachment and eating disorders

Observations of the families of patients with eating disorders commonly indicate patterns of enmeshment (in which family members intrude on each other’s thoughts and feelings), overprotectiveness (an intrusive concern about the child’s psychological and physical functioning), rigidity, lack of conflict resolution, and involvement of the child in parental conflict (Minuchin, Rosman, & Baker, 1978). Disordered eating among women in western cultures has also been associated with deficits in parental care and warmth (Calam, Waller, Slade, & Newton, 1990; Rhodes & Kroger, 1992). In one study including a non-clinical weight-conscious sample of women, the pattern of parental bonding revealed maternal care as the most important predictor of eating problems and body shape concerns (Haudeck, Rorty, & Henker, 1999).
Considering the breadth of family characteristics implicated in the development of eating disorder symptomatology, surprisingly little attention has been given to applying attachment theory to the eating disorders. What evidence there is, though, suggests a higher than usual prevalence of insecure attachment styles in eating disorder populations.

In a study that employed a sample of college women, Heesacker and Neimeyer (1990) examined the relationships between eating disorder symptoms, relational schema measured by a repertory grid technique and object relations function using the Bell Object Relations Inventory (Bell, Billington, & Becker, 1986). The authors found that object relations, as an indication of insecure attachment in early parental relationships, was associated with higher eating disorder scores on the EDI, and that reports of high social incompetence were associated with a greater desire for thinness. Overall, the results revealed that a tightly organized, inflexible interpersonal schema was most strongly associated with eating disorders (Heesacker & Neimeyer, 1990).

Another investigation conducted by Kenny and Hart (1992), including young women in treatment for eating disorders and a college sample, focused more specifically on the relationship between parental attachment and eating disorder symptoms. Based on the EDI as a measure of eating disorder pathology and the Parental Attachment Questionnaire (PAQ; Kenny, 1990), eating disordered females described themselves as less securely attached to their parents and characterized their relationships as more affectively negative. They also described their parents as less supportive of their autonomy and described themselves as less likely to seek out and receive comfort from their parents in times of stress. In contrast, reports of affectively positive and supportive relationship with parents who were perceived as encouraging of autonomy were associated with adaptive functioning, and, in particular, reports of personal effectiveness, low levels of bulimic symptoms and less preoccupation with dieting (Kenny & Hart, 1992).

One final study examined the association between attachment strategies and symptom reporting among college women. This study used descriptions of attachment relationships experienced in childhood based on the adult attachment interview (AAI; Main, Kaplan, & Cassidy, 1985). Women with hyperactivating strategies described attachment experiences typified by unpredictable parenting and these women reported
elevated levels of depressive symptoms. Women with deactivating strategies (believed to develop as a result of unresponsive parenting) reported elevated levels of eating disorder symptoms when scores for depression were controlled for statistically (Cole-Detke & Kobak, 1996).

Given the hypothesized relationship between attachment and alexithymia, it would be reasonable to expect to find a correspondence between these phenomena in eating disorder samples. There is little research investigating the parenting style experienced in childhood, alexithymia, and disturbed eating attitudes and behaviours in adulthood. However, there is tentative support for a link between alexithymia, attachment style and disordered eating. For instance, the findings of one study support a positive relationship between bulimia symptoms and alexithymia, a negative relationship between bulimic symptoms and secure attachment, and a negative relationship between secure attachment and levels of alexithymia (Tricholo, 1998).

Perhaps as a corollary of attachment style, attitudes and beliefs about self and others are reflected in certain psychological themes associated with eating disorders. For example, women diagnosed with binge eating disorder have demonstrated higher alexithymia scores than obese women without binge eating disorder (De Zwaan et al., 1995). The authors of this study reported that the women with binge eating disorder scored higher on the interpersonal distrust and ineffectiveness subscales of the Eating Disorders Inventory - second edition (EDI-2). This pattern might be interpreted as representing a negative view of self and others, which would correspond with the fearful attachment style described by Bartholomew (Bartholomew et al., 1991).

Similar findings have been reported for female patients with anorexia nervosa (Taylor, 1996). Alexithymia scores were found to be significantly and positively correlated with the EDI-2 interpersonal distrust subscale in a student control group, while high alexithymia scores in the anorexia patient group were significantly and positively correlated with the psychological themes of ineffectiveness, interpersonal distrust, interoceptive awareness and maturity fears. In this study alexithymia did not appear to be related to drive for thinness, bulimia and body dissatisfaction subscales of the EDI-2. Taylor and colleagues interpreted their findings as suggesting that alexithymia is related to
several psychological traits of patients with eating disorders and may play a role in their development but is unrelated to attitudes and behaviours associated with abnormal eating, and body weight and shape (Taylor, 1996).

As regards the possibility of heritability of alexithymia, the incidence of, and conditions for, intergenerational transmission has not been well studied. In one study, that included mothers of women diagnosed with eating disorders, it was found that the mothers of women with eating disorders were significantly more alexithymic than mothers of women without eating disorders (Dahlman, 1996). Analysis of the alexithymia (TAS) subscales revealed that the ‘difficulty in identifying feelings’ dimension was the key factor in both the mother’s and daughter’s elevated alexithymia scores. While attachment was not measured directly in this study, the families of women with eating disorders were found to be more conflicted, and less satisfied with the levels of conflict in the family than the families of women without eating disorders. It was not possible, though, to determine whether family conflict was a product of psychopathology or a contributing factor.

Behaviours of both parents, such as comments about appearance, have been shown to influence disordered eating attitudes. For example, an investigation of the role of parental appearance-related commentary, body image and psychological functioning among male and female college students revealed that women and men did not differ in their reports of comments received from mothers, however, women received significantly more appearance-related messages from their fathers (Schwartz, Phares, Tantleff-Dunn, & Thompson, 1999). Significant relationships were found between feedback and body satisfaction for women, not for men, and regression analysis indicated that father’s and mother’s teasing about weight were predictive of daughter’s body image. Psychological functioning of both men and women was significantly predicted from the combination of mother’s and father’s feedback regarding appearance (Schwartz et al., 1999).

A large body of research confirms that individuals who suffer abuse in childhood are at greater risk of developing psychopathology, generally. However, within the context of a multi-factorial model of eating problems, it appears that emotional abuse is the form of childhood trauma that most clearly influences eating psychopathology. One study that investigated the relationships between four different types of childhood abuse (physical,
emotional, sexual, and neglectful) and eating disorder psychopathology in a non-clinical sample found that all forms of abuse were independently related to eating psychopathology when considered individually (Kent, Waller, & Dagnan, 1999). However, when the intercorrelations of the different forms of reported abuse were controlled for, childhood emotional abuse emerged as the most reliable predictor of general eating-disordered attitudes and behaviour. That relationship was perfectly mediated by the women’s levels of anxiety, in particular, and by dissociation, but not by depression. Emotional abuse was defined as parental behaviours that are perceived as being ridiculing, insulting, threatening, blaming, or unpredictable in nature. Age at onset did not moderate the impact of the childhood emotional abuse (Kent et al., 1999).

In summary, a high prevalence of alexithymia is usually found in samples of individuals with eating disorders. High rates of insecure attachment are also found. As regards family factors that may contribute to the development of eating disorder pathology, these remain unclear. However, several themes are apparent in the literature and these appear to overlap with features of the caregiving environment that are associated with emotional development and implicated in the etiology of alexithymia. For example, while no causal relationships have been established, enmeshment, high parental overprotectiveness, low parental care, and low expressiveness have all independently been found to characterize at least some families of eating disorder patients.

1.6 The Relationship between Alexithymia, Depression, and Anxiety

There are a number of unresolved issues regarding the alexithymia construct. One of the most important relates to the positioning of alexithymia as combining trait- and state-like qualities. For instance, there is still controversy as to whether alexithymia, as measured by the TAS-20, reflects persistent aspects of psychological functioning (Horton, Gewirtz, & Kreutter, 1992), is a defense mechanism activated in response to emotional stress (Haviland, MacMurray, & Cummings, 1988), or is secondary to such state factors such as depression and anxiety (Parker, Bagby, & Taylor, 1991). Considering this uncertainty, and, given the high rates of comorbid depression and anxiety found in eating
disorder populations, the possibility that depression and/or anxiety may be associated with or account for the high rates of alexithymia in these individuals must be considered.

Individuals with eating disorders, by virtue of their eating habits, are at increased risk for anxiety and depressive disorders. When seriously underweight, many individuals with anorexia nervosa manifest depressive symptoms such as depressed mood and social withdrawal that may be secondary to the physiological sequelae of semi-starvation. Additionally, obsessive-compulsive features, related and unrelated to food, are often prominent. There is also an increased frequency of depressive symptoms, or mood disorders found in individuals with bulimia nervosa. Most bulimic individuals ascribe these symptoms to the onset of their eating disorder, however, for some individuals the mood disturbance clearly precedes the onset of bulimia nervosa. There is also an increased frequency of anxiety symptoms, such as fear of social situations, or anxiety disorders found in individuals with bulimia nervosa (American Psychiatric Association, 1994).

Empirical research has confirmed high levels of comorbid anxiety and depressive disorders in eating disorder populations (Corcos et al., 2000; De Groot et al., 1995; Schmidt et al., 1993; Sexton et al., 1998) as well as high rates of alexithymia (Bourke et al., 1992; Cochrane et al., 1993; Jimerson et al., 1994; Schmidt et al., 1993; Taylor, 1996). The relationship between depression and anxiety and alexithymia in eating disordered and more general populations, though, is not clear. A number of studies have reported findings of significant positive correlations between alexithymia and depression in a variety of pathological samples. For instance, Haviland and colleagues found a significant correlation between depression measured by the Beck Depression Inventory (BDI) and alexithymia measured by the Toronto Alexithymia Scale (TAS) in a sample of recently sober alcoholics (Haviland, Hendryx, Cummings, Shaw, & MacMurray, 1991), and similar findings have been reported for patients with drug- and alcohol dependency (Haviland, Hendryx, Shaw, & Henry, 1994), for women with bulimia (De Groot et al., 1995), and women with anorexia nervosa (Corcos et al., 2000).

In one of the earlier investigations, Schmidt and colleagues (1993) investigated alexithymia, depression and eating disorder symptoms in three groups of eating disorder patients: AN-R, AN-B, BN, and in a control group. They found that the TAS did not
correlate with depression (measured by the Hamilton Depression scale) at baseline or after a ten-week treatment programme. There was reduction in eating disorder symptoms after ten weeks but no change in alexithymia or depression over this period. While the TAS baseline scores correlated with TAS scores at ten weeks, the TAS did not show a relationship with any other measure. In comparison, depression scores at ten weeks correlated with eating disorder symptoms at ten weeks. The finding of no correlation between depression and alexithymia sets this study apart from other literature, and may due to the measures used. However, given that neither depression nor alexithymia scores changed from baseline to post-test, the results of this study do not disprove a possible relationship between depression and alexithymia (Schmidt et al., 1993).

In contrast, Corcos and colleagues (2000) found that alexithymia and depression were correlated in their eating disorder sample and control group of healthy women. They also found that, after taking depression into account as a confounding variable, the elevated levels of alexithymia in the anorexic group compared with the bulimic group could be accounted for by higher levels of depression in the former group. They suggest that the increased rates of alexithymia in the anorexia compared with bulimia group seem to be more closely related to depression than to an increased alexithymic mode of functioning (Corcos et al., 2000).

Similar results were reported in a study involving adolescents with eating disorders or drug abuse. Alexithymia was found to significantly correlate with depression, however, when depression was controlled for statistically, no significant difference in alexithymia was found between girls with eating disorders and the drug abuse group, or the control group (Chinet, Bolognini, Plancherel, Stephan, & Halfon, 1998). A strong association between alexithymia and depression has also been identified in the general population. For instance, one study of over 2000 men and women (average age of 43 years) found that alexithymia was associated with several sociodemographic factors. However, after including depression in logistic regression models, only depression and low life satisfaction were associated with alexithymia in men and women (Honkalampi, Hintikka, Tanskanen, Lehtonen, & Viinamaeki, 2000).
While some studies, such as that reported by Corcos and colleagues (2000), have found that depression can fully account for alexithymia, other studies have found elevations in alexithymia scores after controlling for depression. In a study that measured depression, eating disorder symptoms, and alexithymia in a control group and in bulimic women pre- and post- a course of intensive psychotherapy, De Groot and colleagues found that depression and alexithymia were correlated at both admission and discharge in the bulimia group (De Groot et al., 1995). Depression and alexithymia were also correlated in the control group. This study used the earlier form of the TAS, and the BDI was shown to correlate with the two TAS factors related to feelings but not with imaginal processes or the externally oriented thinking factors. Once depression was controlled for, the bulimia group scores on the first factor (related to identifying feelings), and the TAS total, remained higher compared with the control group. De Groot and colleagues concluded that alexithymia and depression are overlapping but separate disturbances in women with bulimia nervosa. As the women with persistent eating disorder symptoms at treatment completion did not improve in terms of emotional awareness, despite a significant improvement in depression, it was suggested that, although both mood and emotional awareness can be improved after an intensive psychotherapy programme, emotional awareness is relatively more resistant to change.

In the first study to investigate alexithymia, depression and Axis II personality functioning, Sexton, Sunday, Hurt and Halmi (1998) also found residual elevations in alexithymia after controlling for depression. In their study they included 53 eating disorder inpatients and 14 control subjects and used the original four-factor TAS, the EDI-2, BDI, and a structured clinical interview to diagnose personality disorder. After controlling for depression, only one TAS factor, ‘difficulty expressing feelings to others’, remained significantly different between groups. TAS total scores for the AN-R group remained higher than the control group but not the BN group, while AN-R scores on ‘difficulty expressing feelings to others’ remained higher than both the bulimia nervosa and control groups. Additionally, when the authors compared pre- and post- scores, they found that the TAS total and ‘difficulty identifying feelings to others’ had reduced over the course of treatment and that the change could be accounted for by the decrease in depression (Sexton et al., 1998).
Past research has demonstrated that the factor ‘difficulty identifying feelings and bodily sensations’ in the original TAS is highly related to the clinical state of depression (Kirmayer & Robbins, 1993; Parker et al., 1991). In finding that ‘difficulty expressing feelings to others’ did not vary with level of clinical depression for AN-R, Sexton and colleagues postulated that this aspect of alexithymia may be related to more stable aspects of personality functioning in individuals with this eating disorder subtype (Sexton et al., 1998). This would be consistent with clinical observation that anorexic patients are less emotionally expressive and have higher ratings of alexithymia than bulimic patients (Casper, 1990).

In recent years, investigators of alexithymia have broadened their focus to include anxiety alongside depression and alexithymia. This progression makes good sense because some of the features of depression, such as social withdrawal and agitation, overlap with features of anxiety, and there is high comorbidity between affective and anxiety disorders (American Psychiatric Association, 1994). The inclusion of anxiety in analysis has been very fruitful and helped clarify the relationship between depression and alexithymia. There are not many studies that investigate these constructs in eating disorder samples, so a review of this area necessarily includes studies involving other populations.

Using the revised three-factor alexithymia scale, the TAS-20, Haviland and colleagues (1994) found statistically significant large positive correlations between alexithymia, state anxiety, and depression scores in individuals hospitalized for psychoactive substance abuse (Haviland et al., 1994). This study did not include a measure of trait anxiety. Applying path analysis to test a causal model for alexithymia, state anxiety was found to predict depression and all three TAS-20 factors, while depression predicted only the first TAS-20 factor, difficulty identifying feelings. Finding that all dimensions of alexithymia were related to state anxiety, they proposed that alexithymia is responsive to situational stress and that is fulfills a protective function by shielding the person in stressful circumstances from the pain of full affect. It should be noted that this study is unusual in finding a relationship between the TAS-20 factor externally oriented thinking and state anxiety. No other studies have found such a relationship.
A more recent study of female college students included measures of alexithymia, trait and state anxiety, and depression (Berthoz, Consoli, Perez-Diaz, & Jouvent, 1999). Unfortunately, this study used a French version of the original four-factor TAS rather than the revised TAS-20. Berthoz and colleagues found that state and trait anxiety correlated highly with each other and with depression. With respect to the four TAS factors, both state and trait anxiety, and depression were positively correlated with the first factor: ‘difficulty identifying feelings and differentiating feelings from bodily sensations’. State anxiety was also negatively correlated with ‘reduced daydreaming’, while trait anxiety was positively correlated with ‘difficulty communicating feelings to others’, and negatively correlated with ‘reduced daydreaming’. Depression was positively correlated with ‘difficulty communicating feelings to others’ but not related to ‘reduced daydreaming’. Neither state or trait anxiety, nor depression correlated with the fourth factor, ‘externally oriented thinking’. After controlling for depression in partial correlation analysis, state and trait anxiety remained significantly correlated with the first TAS factor, ‘difficulty identifying feelings and differentiating body sensations’, and trait anxiety remained significantly and negatively associated with the ‘paucity of fantasy’ factor. However, after controlling for state and trait anxiety, depression no longer showed significant relationships with any of the TAS scales (Berthoz et al., 1999).

Marchesi and colleagues investigated the relationship between alexithymia, depression, and anxiety in anxious and depressed patients compared with control subjects (Marchesi, Brusamonti, & Maggini, 2000). They found that anxious and depressed patients had higher TAS-20 total scores than control subjects. Multiple regression showed a positive relationship between the TAS-20 score and scores on both the Hamilton Depression Scale and Hamilton Anxiety Scale (HADS: Zigmond et al., 1983). The difficulty identifying feelings score was higher in both depressed and anxious patients but multiple regression showed this TAS-20 factor was positively related to HADS anxiety, but not to the HADS depression score. The difficulty describing feelings score was higher in depressed patients than anxious patients or control subjects, and a positive relationship was found between this TAS factor and HADS depression but not to the HADS anxiety score. No difference was observed between any of the groups for the externally oriented thinking scores. However, multiple regression showed that this factor was related to the HADS depression score but no the HADS anxiety score. Factor analysis for the TAS-20...
and HADS items revealed five factors. Three of the factors included items from only one of the scales, while two included a mix of items from TAS-20 and HADS scales. These results suggest some overlap between HADS anxiety and the TAS-20 difficulty identifying feelings factor, but that HADS depression and alexithymia are separate constructs.

Jimerson and colleagues (1994) were the first to report the relationship between TAS factor scores and anxiety and depression in an eating disorders sample (Jimerson et al., 1994). They report high correlations between the TAS and STAI trait anxiety, and between the TAS and BDI in a group of women who had been diagnosed with bulimia nervosa but were free of major depression compared with healthy controls. Consistent with previous studies, the BDI and STAI were also found to be highly correlated. In this study, which used the original four-factor TAS, bulimia patients scored significantly higher than the control group on the two TAS factors related to identifying and describing feelings but not on 'externally oriented thinking' or 'paucity of fantasy'. When depression and anxiety ratings were controlled, scores remained higher for patients than controls on the first TAS factor, 'difficulty identifying feelings to others', and the TAS total score but not on other factor scores. These findings were replicated by Sureda and colleagues (Sureda, Valdes, Jodar, & de Pablo, 1999). Without going so far as to propose a causal model, Jimerson and colleagues suggest that in interpersonal situations, affect deficits associated with alexithymia may contribute to feelings of uncertainty and low self-esteem, which in turn may contribute to depression, anxiety, and impulsive behaviour (Jimerson et al., 1994). This is contrary to the view that alexithymic features in some individuals with bulimia nervosa may be secondary to underlying depression (Sifneos, 1991).

Although alexithymia was originally presented as a stable personality trait, continuously distributed in the general population, the stability of part, or all, of the construct has come under question in recent years. With regard to temporal stability, the most convincing evidence comes from time-series, or repeat measure collection of data. One such study, involving a six month follow-up study of depressed outpatients, found that almost 40 per cent of the patients were considered alexithymic at baseline, but only 23 per cent at follow-up. The BDI depression scores were able to account for 23 per cent (at baseline) and 42 per cent (at follow-up) of variation in TAS-20 scores. The authors
concluded that alexithymia changes as a function of depression (Honkalampi, Hintikka, Saarinen, Lehtonen, & Viinamaeki, 2000).

In a further study, Honkalampi and colleagues found that alexithymia was correlated with depression and anxiety, but there was also evidence in support of alexithymia as consistent, stable and unchanging relative to depression or anxiety (Honkalampi, Hintikka, Tanskanen et al., 2000). In one study that included a twelve month follow-up, Salminen et al. (1994) administered a Brief Symptom Inventory and TAS to patients as they were admitted to a general psychiatric outpatient's clinic, and again one year later. The majority of the patients were diagnosed with anxiety or depression disorders and 65 per cent received psychiatric treatment. While there was a significant decrease in psychological distress over one year the authors found that there was no change in the mean alexithymia score.

Similar findings were reported by Porcelli and colleagues (1997) for patients diagnosed with inflammatory bowel disease. In a longitudinal study, Porcelli and colleagues tested for alexithymia (using TAS-20) and assessed the level of disease activity as well as administering the Hospital Anxiety and Depression Scale. Patients were assessed prior to treatment and again after six months. Among those whose physical condition improved there were marked significant reductions of anxiety and depression scores but no corresponding reduction in the mean alexithymia score. The test-retest reliability of the alexithymia scale for the group as a whole, irrespective of physical outcome, was indicated by $r = 0.95$ which demonstrates a high level of stability in this patient group.

As a multidimensional construct, alexithymia may be both stable and responsive to situational stressors. One study that put this to the test found that alexithymia dimensions were independent, and that the difficulty identifying feelings and difficulty describing feelings dimensions, but not the externally oriented thinking factor, were related to anxiety and depression. The authors concluded that certain dimensions of the alexithymia construct are state-dependent (Hendryx, Haviland, & Shaw, 1991). In support of this, several follow-up studies of clinical samples have revealed that change in depression scores is associated with a corresponding change in alexithymia scores. For instance, one
such study included a twelve month follow-up to determine the association between alexithymia and depression in outpatients with major depressive disorder, compared with over 500 control subjects from the general population. The study found that severity of depression was significantly associated with alexithymia, and, additionally, that the BDI-II scores increased or decreased proportionately with the change in TAS-20 score in both groups (Honkalampi, Hintikka, Laukkanen, Lehtonen, & Viinamaeki, 2001). These findings directly contradict the reports of Salminen (1994), Porcelli and colleagues (1997), and Honkalampi and colleagues (2000).

Beyond an agreement of an association between the constructs, there is limited understanding of the complexity of relationships between anxiety, depression and alexithymia. It seems that depression and anxiety may be related to the ‘feelings’ dimensions of alexithymia. With respect to depression, more studies seem to have found a relationship between depression and the first TAS-20 factor, difficulty identifying feelings, some have found a stronger relationship between depression and the second factor, difficulty describing feelings, while others have found that the relationship between depression and alexithymia can be accounted for by anxiety. With respect to anxiety, it seems that trait anxiety in particular, may be more broadly related to the dimensions of alexithymia, although relationships have also been demonstrated between state anxiety and alexithymia. These constructs have been little studied in eating disorder populations, however, findings to date suggest there may be a subset of patients with bulimia nervosa who have alexithymic features that are independent of depression and anxiety.

The findings from a growing body of research suggests that Corcos and colleagues are correct in suggesting that the high rates of alexithymia in eating disorder samples cannot be interpreted without taking depression into account (Corcos et al., 2000). A review of the literature suggests that anxiety should also be entered into the equation. With respect to the study of alexithymia in clinical samples generally, it has been suggested that the presence of anxiety and depression may confound results and, therefore, to ensure robustness of findings, steps must be taken to control for the possible effect of these variables (Kooiman, 1998).
1.6.1 Sociodemographic Variables

Consideration must also be given to other possible confounds. While sociodemographic variables have been shown to correlate with alexithymia, findings are mixed. The inconsistency in findings is, perhaps, a function of different methodologies employed, interaction effects between variables, and/or the different populations studied. With regard to gender, for instance, several studies have found women to have higher levels of alexithymia, depression and anxiety than men (Haviland et al., 1994; Posse & Haellstroem, 1999). In one of these studies higher alexithymia scores were also associated with increasing age, lower education, more children in the family, and living alone (Posse et al., 1999). Other studies, though, have found that men score more highly than women on alexithymia measures (see, for example, Carpenter & Addis, 2000). With respect to age, a study that employed a sample of college students, found a low magnitude correlation was found between TAS-20 scores and age of participants (Bagby, Parker et al., 1994). However, the findings with respect to the relationship between alexithymia and age also appear to be inconsistent. For instance, while Pasini and colleagues also report finding a positive relationship (Pasini, Delle Chiaie, Seripa, & Ciani, 1992), Morrison and Pihl (Morrison & Pihl, 1989) and Kench and Irwin (Kench et al., 2000) report negative correlations between alexithymia and age.

Socioeconomic status and education may also have an association with alexithymia. One study of patients with coronary heart disease reported that logistic regression revealed that the factors independently associated with alexithymia included either currently or previously being a blue collar worker, as well as self-rated depression, and dissatisfaction with life (Valkamo et al., 2001). Another study of depressed outpatients found that almost half of the patients were alexithymic, and that those with higher alexithymia scores were significantly more often male, unmarried, and had lower education than those with low alexithymia scores. Logistic regression analyses revealed that four factors were associated with alexithymia: male gender, low level of education, low life satisfaction and severe depression (Honkalampi, Saarinen, Hintikka, Virtanen, & Viinamaeki, 1999).

In summary, there is tremendous variation in research conducted in this area, in terms of strength of design and methodology employed, as well as in population
investigated, sampling techniques, and analyses applied. Without doubt these factors have contributed to inconsistent, inconclusive and, in some cases, conflicting findings. For example, it is particularly important to take confounding variables into account in cross-sectional research designs and yet very few studies have done so. There appears to be strong evidence that depression, anxiety and, possibly, sociodemographic variables, correlate with alexithymia in both the general population and in clinical populations. It remains uncertain, though, as to whether these variables fully account for elevated alexithymia scores in an eating disorder population, and, if so, whether in all or some eating disorder subtypes. The complexity of the inter-relationships between these constructs has yet to be elucidated.

1.7 The Research Hypotheses

This study was designed to investigate the relationship between the dimensions of alexithymia, parental bonding (as a corollary of early attachment relations), and adult attachment in a sample comprised of women diagnosed with eating disorders and women from the general population. Measures of anxiety and depression, identified as potential confounding variables, were included in the research. The study also aimed to examine associations between alexithymia, parental bonding and attachment, and self-reported eating disorder symptomatology. Based on literature that describes the theoretical foundations of the alexithymia construct as well as hypothesized and substantiated relationships between the constructs under investigation, the following hypotheses have been formulated:

Hypothesis one:

Group differences will be observed between the eating disorders and comparison groups in eating attitudes and behaviours as well as psychological themes associated with eating disorders as measured by the EDI-2.
Hypothesis two:
It is expected that, relative to the comparison group, the eating disorders group will show elevations in alexithymia scores.

Hypothesis three:
It is expected that, relative to the comparison group, the eating disorders group will report sub-optimal parental bonding, reflected by lower levels of parental care and higher levels of parental overprotection.

Hypothesis four:
Given that attachment style depends on caregiving experience and empirical research to date suggests relative continuity of attachment through the lifespan, it is expected that parental bonding dimensions of care and overprotection will predict adult attachment style, where attachment is described by subjective ratings of avoidance and anxiety in close interpersonal relationships.

Hypothesis five:
Consistent with the alexithymia construct it is expected that parental bonding and adult attachment style will correlate with, and predict, alexithymia scores.

Hypothesis six:
Given the high rates of comorbidity, it is expected that the eating disorders group will report higher levels of depression and anxiety relative to the comparison group.

Hypothesis seven:
It is expected that higher levels of self-reported depression and anxiety in the eating disorders group will account for some of the elevation in alexithymia scores. However, there are conflicting research findings as to whether depression and/or anxiety can entirely account for elevated alexithymia in eating disorder populations. This will be investigated by controlling for depression and anxiety in statistical analysis.
Hypothesis eight:

It is anticipated that the parental bonding scores, adult attachment dimensions, and alexithymia scores will predict elevations on the EDI-2 subscales associated with eating disorder symptomatology: 

- drive for thinness,
- bulimia,
- body dissatisfaction,

as well as several psychological themes associated with eating disorders, including:

(i) ineffectiveness,
(ii) interoceptive awareness,
(iii) interpersonal distrust,
(iv) impulse regulation,
(v) social insecurity.
2. METHOD

2.1 Overview

The current study employed a cross-sectional, between-groups design to examine the relationships between alexithymia, parental bonding, dimensions of adult attachment and eating disorder pathology. Ethical approval for this investigation was given by the University of Canterbury Human Ethics Committee, and all participants gave informed consent. Copies of the letter, information sheet and consent form given to participants are attached as Appendices 1, 2, and 3.

2.2 Participants

High rates of alexithymia have been reported in a number of clinical populations including individuals with eating disorders. For the purposes of the present study it was decided to recruit an experimental group of individuals with eating disorders and a comparison group from the general population. In summary, a total of 30 women currently receiving treatment for eating disorders were recruited for the experimental group, and a total of 83 women from the general population were recruited for the comparison group.

Eating Disorders Group

All patients currently registered with the eating disorders service at The Princess Margaret Hospital, Christchurch, were sent letters inviting them to participate in the study. Enclosed with the letter were an information sheet, outlining the areas of interest for the study and the procedure, and a consent form (See Appendices 4 and 5). In total, 55 letters were sent by the eating disorders service, including three sent to in-patients and 52 sent to out-patients of the service.

It was decided that data for the study would be collected as part of a larger study investigating basic beliefs, emotional reactivity, early relationships and eating patterns. Consolidating data collection for the two studies provided the opportunity to offer individuals an incentive to participate by offering personalised feedback on ‘thinking style’ or ‘lifetrap’ as identified by responses to Young’s Schema Questionnaire. Participants
could also indicate whether they wanted the questionnaires that they completed as part of the study to be passed to their treating clinician for later reference and interpretation.

Individuals contacted were asked to indicate whether they would or would not like to participate on a detachable form, and return this to the service with the completed consent form if applicable (required from those wishing to participate). The service received a response from approximately half of the individuals who had been sent letters, mostly in the affirmative but some declining participation. Those individuals, who returned their expression of interest form indicating that they wished to take part in the study, were contacted to arrange an appointment time. In the case that no response was received, the initial letter was followed up with a telephone call. Approximately half of those individuals who received a follow-up telephone call said they had ‘just not got around’ to returning their form, indicated they wished to participate, and a time was arranged to meet.

Of the 55 individuals contacted about the study, 40 indicated that they would like to participate. Of this group, one person was out of the country during the data collection period, three could not make a time during the data collection period, and four people did not turn up for appointments and did not respond to further attempts to make contact. This left a total of 32 individuals who took part in the study. However, this group included two men whose data was excluded from analysis, therefore making an experimental group of 30 women. A total of 15 women who had been invited to join the study indicated that they did not wish to have an involvement. Of this group, one woman had left the service, and 14 declined for other reasons. A number of the women who declined were in a younger age group and would have been included in the second study but would have been excluded from analysis for the present study: this group included four individuals aged 14 years, one aged 15-years, and one aged 16-years. The remaining nine women who declined ranged from 21- to 29- years of age. Reasons given for not wanting to participate included being ‘too busy’ (1), ‘intention to disengage from the service’ (1), ‘physically/psychologically unwell’ (2), and ‘no interest’ (10).

The final experimental group, therefore, included 30 female patients who had received an eating disorder diagnosis at time of admission and were currently registered with the eating disorders service at The Princess Margaret Hospital, Christchurch. Two of
the women in the experimental group were in-patients at the time of data collection, the other 28 were either day-patients or out-patients.

Comparison Group

A comparison group of 83 female adults was recruited through personal contacts. As an incentive to take part in the study, two prize draws of $150 were offered. Each participant was given a pack that included an introduction sheet, an information sheet, a consent form, and the self-report questionnaires that were to be completed. The introduction sheet identified the contents of the pack, outlined what was required of the participant and provided an indication as to how much time to allow to complete the questionnaires (see Appendix 1). Additionally, the importance of completing the questionnaires within the same timeframe (same afternoon or evening) was emphasized, and participants were asked to complete them in one sitting if possible. The information sheet outlined the purpose of the study, identified the people involved in the study, gave assurances of confidentiality and security of information held, and also provided details about the prize draw (see Appendix 2). Contact details of the researcher were provided in case further information was needed. The consent form was a standard form, using Times New Roman typeface, designed to meet the Canterbury Human Ethics Committee guidelines (see Appendix 3). At the bottom of the consent form participants were asked to indicate whether they wished to take part in the prize draw, and space was provided for their contact details, which could be any of telephone number, postal address, or email address.

The pack for the comparison group included six questionnaires, described in the next section, representing the best available measures of the constructs under investigation. The questionnaires did not require the participant to identify themselves by name so identity was protected and, instead, were numbered to correspond with allocated participant numbers.
2.3 Measures

Six psychometrically sound instruments were selected to measure the variables of interest. The questionnaires used in the study allowed collection of sufficient demographic and weight history information for statistical analysis.

*Alexithymia*

The Toronto Alexithymia Scale - 20 items (TAS-20: Taylor, Bagby & Parker, 1994; See Appendix 6) is a well-validated and widely used self-report questionnaire used to assess alexithymia. The authors of the scale report that the TAS-20 demonstrates good internal consistency and test-retest reliability (Bagby, Taylor et al., 1994). Analysis of the scale demonstrated a three-factor structure that is theoretically congruent with the alexithymia construct. Confirmatory factor analysis has demonstrated the stability and replicability of the measure's three factor structure in both clinical and non-clinical populations (Bagby, Parker et al., 1994). The construct validity of the TAS-20 is supported by evidence of convergent and discriminant validity in samples of university students as indicated by a pattern of correlations with the scales for the NEO Personality Inventory (NEO-PI: Costa & McCrae, 1985), as well as separate measures of psychological mindedness. Concurrent validity of the scale was demonstrated by positive correlations with observer-ratings of alexithymia in a sample of behavioural medicine out-patients (Bagby, Taylor et al., 1994). The TAS-20 has, since publication, been translated and cross-validated in samples across more than a dozen countries. The original twenty-six item TAS and revised version, the TAS-20, are, reputedly, the most widely used measures of alexithymia (Taylor, 2000).

The TAS-20 includes three sub-scales that correspond with the factor structure of the full scale. The first subscale, *difficulty identifying feelings* (DIF), assesses the ability to identify feelings and to distinguish between feelings and the bodily sensations of emotional arousal. The second subscale, *difficulty describing feelings* (DDF), assesses ability to describe or communicate feelings to other people, and the third subscale, *externally oriented thinking* (EOT), assesses the degree of external cognitive orientation. The first two factors strongly correlate, which is to be expected since the ability to communicate feelings is considered to be contingent on an ability to recognize one's own emotions. Factors two and three are correlated, as an externally oriented cognitive style
indicates little or no reference to a person’s inner feelings/experience. Together, factors two and three appear to reflect the pensée opératoire (Bowlby, 1977) aspect of the alexithymia construct – a cognitive style that shows a preference for the external details of everyday life rather than thought content related to feelings, fantasies, and other aspects of a person’s inner experience (Bagby, Parker et al., 1994; Nemiah, Freyberger, & Sifneos, 1976).

The 20-item scale takes about ten minutes to complete. Items are scored 1-5 with some items reverse scored, then added for subscale scores. Subscale scores have, in the main, been excluded from analysis, and researchers have tended to use a total TAS-20 alexithymia score for analysis. The present study used raw TAS-20 subscale scores in addition to the TAS-20 total score.

**Parental bonding**

It is theorized that care and overprotection are two important dimensions of parental contribution to the parent-child bond (Parker et al., 1979). Indeed, these two factors have been consistently supported as principle dimensions of parenting by factor analytic studies, with the care dimension receiving empirical support as the major parental dimension (Parker, 1990; Parker et al., 1979).

The Parental Bonding Instrument (PBI: Parker, Tupling, & Brown, 1979) is a 25-item retrospective self-completion questionnaire that asks individuals to report characteristics of their parents as they remember them in their first 16 years of life. The PBI is completed in two parts with the same questions applied to the individual’s mother, then father. Participants score their parents on 25 items using a four-point Likert scale which is scored 0-3 (See Appendix 7). The PBI takes about ten minutes to complete.

The instrument is comprised of two subscales: care (12 items) and overprotection (13 items), reflecting the factor structure of the full scale. The subscales can be used separately or combined to provide a measure of parental bonding. When the two dimensions are considered as bipolar axes, five parental bonding possibilities are produced (see Figure 1.). ‘Average’, represented by the bisect of the two dimensions, is defined statistically. The four quadrants have been described in terms of bonding typologies.
(Parker et al., 1979). Thus, optimal bonding is defined by high care and low overprotection. This parenting style is characterized by affection and closeness coupled with promotion of the child's autonomy and independence. Affectionless control is distinguished by low levels of care, tending towards emotional coldness, combined with high parental overprotection, which might be described as intrusion of privacy and prevention of independent behaviour. Affectionate constraint is associated with high levels of parental care and emotional sensitivity, and high levels of overprotection. In this model, neglectful parenting, conceptualized as comprising low levels of parental care (emotional coldness) and low overprotection promoting independence and autonomy, is associated with absent or weak bonding.

In particular, a bond characterized by affectionless control has been linked with increased risk of neurotic disorders (Parker, 1989).

<table>
<thead>
<tr>
<th>Low Care</th>
<th>High Care</th>
</tr>
</thead>
<tbody>
<tr>
<td>'Absent or Weak Bonding'</td>
<td>'Optimal Bonding'</td>
</tr>
<tr>
<td>'Affectionless Control'</td>
<td>'Affectionate Constraint'</td>
</tr>
</tbody>
</table>

**Figure 1: The two scales of the Parental Bonding Instrument showing the conceptualized parental bonding possibilities.**

A 1989 review of the psychometric properties of the PBI found that it has satisfactory reliability and validity (Parker, 1989). At least three studies report internal consistency, with coefficient alpha’s ranging from 0.87 to 0.94, and split-half reliability was also satisfactory. High test-retest reliability has been demonstrated over two months, and moderate consistency has been shown over extended periods of up to ten years.
Various strategies have been employed to investigate whether the perceived parental characteristics derived from the PBI correspond with actual parental characteristics. There is substantial support for the PBI as a measure of actual parenting, although Parker argues that perceived quality of parenting may be more important in terms of the construct's association with adult adjustment (Parker, 1983).

The factor structure of the PBI has been confirmed in clinical and non-clinical samples. Importantly, scores on the PBI do not appear to be distorted by depressed mood. Additionally, no association between age of participant and scores for parental care and overprotection has been found, and no clear association between social class and PBI dimensions. Similarly, no relationship has been found between sex of the participant and mean scale scores for parents. However, there are consistent reports of differences between maternal- and paternal-subscale scores. In particular, there seems to be a tendency for subjects to score their mothers higher than their fathers on both care and overprotection scales.

In support of construct validity of the scale, studies have demonstrated that PBI scores are not affected by trait characteristics such as plaintive set, or social desirability. Predictive validity has been demonstrated in relapse rates in schizophrenia, and in the ability to predict recovery from depression in post-partum mothers 30 months after initial assessment (Parker, 1989). Considering the number of other factors that also influence recovery and relapse rates in mental illness, even modest levels of predictive validity are noteworthy.

In summary, the Parental Bonding Instrument is a useful measure for considering variation in parenting style and for examining the influence of parental caregiving dimensions on psychological and social functioning. The PBI has proven to be psychometrically sound and offers flexibility as a research tool in that participant scores may be used categorically or dimensionally. The present study used raw PBI subscale scores.
**Adult attachment dimensions**

Until recently adult attachment measures have suffered from a number of psychometric limitations (see, Brennan et al., 1998; Fraley et al., 1998). Early attachment instruments classified people into discrete categories or attachment types in accordance with an early conceptualization of attachment ‘patterns’ or prototypes promoted by Ainsworth and colleagues (Ainsworth et al., 1978; Bartholomew et al., 1991; Hazan et al., 1987). However, more recent research has shown that a taxonomic model is not the best way of representing adult attachment variability and it has been suggested that imposing a categorical model on attachment can lead to serious problems in conceptual analyses, as well as statistical power, and precision of measurement (Fraley et al., 1998).

In recent years adult attachment has been re-conceptualized as a dimensional construct best represented as two discriminant functions usually labeled ‘anxiety’ and ‘avoidance’ (Brennan et al., 1998). By implication, the focus of measurement has shifted to embrace the dimensional model of attachment. However, despite advances, as yet there is no demonstrably reliable and valid instrument to measure the dimensions of adult attachment (Fraley et al., 2000). Following an item response theory analysis of several multi-item attachment measures, Fraley, Brennan and Waller, published a number of items that they combined to form the Experiences in Close Relationships Questionnaire-Revised (ECR-R: Fraley et al., 2000). This scale shows great promise, however the authors make explicit several limitations. First, the scale assesses high levels of security (low avoidance and low anxiety) with much less precision than insecurity. Second, many of the items are conceptually redundant; the scale, they say, would benefit from greater diversity in content of items.

The Close Relationships Questionnaire (CRQ) is a 32-item self-report questionnaire developed for the purposes of the study (see Appendix 8). The questionnaire was constructed using Fraley and colleagues’ valuable analysis of adult attachment scales to guide item selection (Fraley et al., 2000). A number of the items were selected from the ECR-R. However, several items were reworded to create a balance between the number of items reading positively and negatively. Some items were eliminated because they were considered too similar to other items, and some new items were added to increase the
range, or diversity of content of the scale. Also, the number of items was rebalanced to reflect a combination of 'romantic relationships' and other 'close relationships'.

The items in the CRQ are presented as a series of statements and respondents are asked to decide to what extent they agree or disagree with each statement, choosing a number from a seven-point Likert scale. Some of the statements refer to romantic relationships while others refer to close relationships. The items are counter-balanced to read positively and negatively, and items from each of the two subscales were randomly ordered. The questionnaire asks respondents to rate such things as comfort with closeness, depending and trust in others, fear of abandonment, and ease of sharing feelings in close and romantic relationships. The CRQ takes between 10-20 minutes to complete. Importantly, the scale had not been assessed for its psychometric properties prior to its use in the present study.

![Diagram](image)

**Figure 2**: The two hypothesized dimensions of adult attachment that form the basis of the 'Close Relationships Questionnaire'.

**Anxiety**

The State-Trait Anxiety Inventory (STAI: Spielberger, 1983, see Appendix 9) is a self-report questionnaire in two parts, each consisting of 20 items, measuring state and trait anxiety. The STAI is widely used and well-validated and has demonstrated high reliability
against innumerable populations including a New Zealander sample (Knight, Waal-Manning, & Spears, 1983). Internal consistency is reported to be high with alpha coefficients mostly above 0.90 for the full scale, and with a median of 0.93 for the state scale and 0.90 for the trait scale. The trait anxiety scale is considered to measure relatively stable individual differences in anxiety proneness, while the state anxiety scale is considered to measure subjective feelings of tension, apprehension, nervousness, worry, and level of arousal of the autonomic nervous system at the given time. The STAI can differentiate between normal individuals and psychiatric patients for whom anxiety is a major symptom. It takes between 10 and 20 minutes to complete.

The two scales can be used separately or concurrently, depending on whether state- and/or trait-anxiety is the variable of interest. The present study used raw scores for both state and trait scales.

**Depression**

The Beck Depression Inventory – second edition (BDI-II: Beck, Steer, & Brown, 1996, Appendix 10) is a 21-item self-report questionnaire for measuring the severity of depression. Items are concerned with the experience and symptomatology of depression. The BDI-II was developed to be consistent with the Diagnostic and Statistical Manual – fourth edition (DSM-IV: American Psychological Association, 1994) but it is not, in itself, diagnostic.

Psychometric properties of the BDI-II have been assessed using clinical and non-clinical samples. The BDI-II has demonstrated good internal consistency with coefficient alphas of 0.92 and over for college students and outpatients. Test-retest reliability was measured by administration in outpatient sessions one week apart, showing a high and significant correlation of 0.93 (p < .001). Construct validity is suggested by convergent and discriminant validity with other measures of depression including the Beck Depression Inventory-IA (BDI-IA: Ball, Archer, & Imhof, 1994) and the Hamilton Psychiatric Rating Scale for Depression (HRSD: Hamilton, 1960) as well as measures of anxiety.

In a study of outpatients, the BDI-II did not appear to correlate with race or age, but a significant mean difference in scores was found with respect to sex, with females scoring
slightly higher than males. In a study of college students there was a small but significant inverse relationship between BDI-II score and age, and similar findings with respect to sex. Factor analysis of the BDI-II revealed two factors that relate to somatic-affective and psychological-cognitive aspects of depression (Beck et al., 1996).

Respondents are asked to endorse the most characteristic statement under each of the 21 item headings, covering a time frame of the “past two weeks, including today”. Each item is rated on a four-point scale and scores range from 0-3. The questionnaire takes between five and 10 minutes to complete.

Arguably, the BDI, and now the updated BDI-II, are the most widely accepted instruments for assessing the severity of depression in diagnosed patients and for detecting possible depression in normal populations (Piotrowski & Keller, 1992). Guidelines for screening for clinical depression are provided in the BDI-II manual, and “cut-off” scores based on optimal scores derived from a large clinical sample are provided. For the purposes of this study, raw BDI-II scores were used to test for depression as a possible confounding variable, as previous research has suggested that depression can account for elevated alexithymia scores.

Eating attitudes and behaviours and associated psychological themes

The Eating Disorder Inventory – second edition (EDI-2: Garner, 1991; see Appendix 11) is a 91-item self-report measure that is widely used to identify disordered eating attitudes and behaviours and associated psychological themes. It is also a valid instrument to use with non-eating disordered populations and it has been used extensively in research (EDI-2 manual: Garner, 1991). The first 64 items generate eight subscale scores that have proven reliability and validity, while the last 27 items provide scores for three provisional subscales. Of the validated subscales, three assess attitudes and behaviours concerning eating, weight and shape, and five subscales tap more general organizing constructs including ineffectiveness, perfection, interpersonal distrust, interoceptive awareness, and maturity fears. The three new subscales measure asceticism, impulse regulation and social insecurity.
The eight EDI-2 subscales included from the EDI have demonstrated internal consistency with coefficient alphas of between 0.83 and 0.93 for an eating disorder sample, with very similar findings for non-patient college females (Garner, 1991; Garner & Olmsted, 1984). In a study that combined eating disorder patients from New Zealand with a Swedish sample, alphas were reported as being somewhat lower, ranging from between 0.70 and 0.81 (Welch, 1988, c.f. Garner, 1991). The EDI-2 has demonstrated impressive test-retest reliability with subscale coefficients ranging from 0.79 and greater at one week to 0.80 and greater at three weeks. Construct validity has been demonstrated through both convergent validity, for instance, with the Eating Attitudes Test (EAT–26: Garner, Olmsted, Bohr, & Garfinkel, 1982), as well as discriminant validity. Factor analysis has clearly identified and confirmed the eight original subscales that have been retained from the EDI.

Importantly, in a number of studies the EDI subscales have demonstrated ability to differentiate between eating disorder and non eating-disorder samples. While a non-patient subgroup of weight-preoccupied women in the general population has been identified, most of these individuals do not show a pattern of core features associated with eating disorders, such as feelings of ineffectiveness or lack of interoceptive awareness (Garner, 1991).

In completing the questionnaire, respondents are asked to decide how true each scale item is for them and to circle a letter corresponding with Always (A), Usually (U), Often, (O), Sometimes (S), Rarely (R), or Never (N). The EDI-2 takes approximately twenty minutes to complete. In scoring, responses for each item are weighted from zero to three, with a score of 3 assigned to the response farthest in the “symptomatic” direction (“always” or “never” depending on whether the item is keyed in the positive or negative direction), a score of 2 for the immediately adjacent response, a score of 1 for the next adjacent response, and a 0 score assigned to the three responses farthest in the “asymptomatic” direction. The rationale for the 0-3 scoring system rather than a 1-6 scoring system is rational-theoretical rather than empirical. It rests on the assumption that item scaling on the EDI-2 is continuous only for the response weighted 1-3. Garner explains that responses in the non-symptomatic direction should not aggregate to contribute to a total subscale score reflecting psychopathology since these responses reflect
an absence of pathology (Garner, 1991). Scores are compared with normative data. As each subscale is intended to measure a conceptually independent trait as dimensional constructs, this study elected to use raw subscale scores as continuous data.

In addition to item responses, participants completing the EDI-2 were required to answer questions on weight and dieting history. This allowed body mass information to be calculated from self-report data on weight and height using an established formula: Body Mass Index (BMI) = weight / (height)$^2$. Height and weight estimates were converted into metric units (centimetres and kilos) where necessary. Given the diagnostic criteria for the eating disorders anorexia nervosa (AN) and bulimia nervosa (BN) include reference to weight relative to norms, obtaining and analyzing BMI information is important.

2.4 Conceptual Overlap Between Scales

When several scales are being used to measure related constructs, it is especially important to eliminate the possibility of erroneous intercorrelation due to overlapping or repeated items. In the case of overlap, depending on the degree of overlap identified, either the repeated items should be excluded from the subscale in one of the scales and the subscale score adjusted appropriately, or the subscales in question should be selectively excluded from analysis. The value of this exercise is particularly relevant to this study because, during development of the TAS-20, four of the items included in the TAS-20 difficulty identifying feelings subscale were derived from the interoceptive awareness subscale of the EDI-2 (Taylor et al, 1985; Bagby, Parker et al., 1994; Taylor, Ryan, & Bagby, 1985). It was decided that the TAS-20 and EDI-2 questionnaires should be left intact for data collection but that the subscales should be selectively removed at the point of analysis. All remaining questionnaires used in the study were compared and items inspected for conceptual overlap. However, no further overlap between scale-items was identified.
2.5 Procedure

All participants were recruited over the period October-December 2001. Those included in the experimental group completed the questionnaires at the Eating Disorders Service, in the presence of the researcher, over the period November 2001-January 2002. Comparison group participants returned their completed questionnaires by the end of November, 2001.

Participants in the experimental group met individually with the researcher who provided an outline of the areas of interest for the study, explained who was involved, discussed confidentiality and answered any questions. If not already received, informed consent was sought at this time. Each participant was seated at a desk and was given a brief description of the requirements of the questionnaires to ensure the instructions for each was understood. The participant completed the questionnaires without a time constraint in the presence of the researcher so that any queries could be addressed. The majority of participants completed the questionnaires in one sitting, taking between 40 and 90 minutes. Breaks were taken as required. One of the day-patient participants and one of the out-patient participants completed the questionnaires in two sittings due to fatigue and time pressures, respectively. In these cases the participants were asked to review their responses from the first sitting to ensure they were still in agreement.

The order of presentation of the measures for both groups was randomised to control for the possibility of an order effect. The total length of time to complete all questionnaires varied, taking between 40 minutes to 90 minutes depending on individual differences in ‘test-taking’ behaviour as well as variation in reading ability. Individuals in the experimental group (women with eating disorders) were offered the option of completing questionnaires in one or two sittings; all but two individuals completed them in one sitting. Eating disorder participants completed the questionnaires in the presence of the researcher so that they could ask for clarification of instructions, put questions or raise any concerns they might have at the time. With respect to the comparison group, the questionnaires were left with participants to complete in their own time and either collected or returned by the participant at a later date.
2.5 Contingency for Dealing with Suspected Risk of Harm

It was not anticipated that participation in the study would, in itself, be a cause of personal distress, however, such an outcome could not be discounted, particularly as the study included a clinical sample of women receiving treatment for eating disorders, and some of the questions related to issues around eating, weight and body image. It is usual to find a high rate of depression in such a sample and it was, therefore, important to have a predetermined plan for dealing with risk of self-harm. As the procedure for the eating disorder group varied from that of the comparison group, the contingency for dealing with risk of self-harm was dependent on group membership.

As regards the eating disorder group, once each participant had completed the questionnaires, the researcher checked to make sure all questions and items had been answered. During this process the researcher noted the self-reported level of depression as indicated by responses to the Beck Depression Inventory – Second Edition (BDI-II: Beck, 1996), and, in particular, how the participant had responded to the group of statements under the heading 'Suicidal Thoughts or Wishes'. In the event that the participant had responded with either 'I would like to kill myself' or 'I would kill myself if I had the chance', the researcher drew attention to this, sensitively, and outlined her ethical responsibility to assess risk of harm. Further questioning enabled the researcher to make an assessment.

Nine of the 32 participants in the eating disorder group indicated strong thoughts of suicide on the BDI-II. While all of these individuals were considered to be at risk of self harm, after completing a risk assessment, none was considered sufficiently high risk to take immediate action. In each case the researcher informed the participant that she would contact either her clinical supervisor, Averil Overton, or the relevant treating clinician to pass on her concerns and any relevant information.

As regards the comparison group, assessment of risk of harm was limited to viewing responses to completed questionnaires including the BDI-II. Instances where risk of harm was considered possible were discussed by the researcher and her thesis supervisor.
Considering participants had willingly volunteered to participate in the study and were not soliciting an opinion on their mental state, it was considered unethical to take steps by contacting individuals unless their responses gave sufficient cause for concern.

Participants’ responses to the group of statements under the heading ‘Suicidal Thoughts or Wishes’ were checked as a matter of course. None of the participants in the comparison group indicated that they were having strong suicidal thoughts. There were several instances where a participant’s total BDI-II score fell in the ‘moderate’ or ‘severe’ range. However, on checking any response to individual questions on the BDI-2 and State Trait Anxiety Inventory (STAI; Spielberger, 1983) that might have suggested that the person was experiencing disturbing thoughts that were uncontrollable and causing fear and/or distress, it was decided there was insufficient reason to make contact on the grounds of risk of harm.

2.6 Data Analysis

Data analysis was performed using Statistica 6.0. The demographic and scale scores for experimental and control groups were compared using two-tailed t-tests for independent means. Chi square analysis was used to investigate differences between groups on education level, followed by two-way analysis of variance for uneven groups to test whether alexithymia covaried with education. Pearson product moment correlation coefficients were calculated to identify the association between variables and to determine the significance of relationships. Multivariate analysis of variance and multivariate analysis of covariance was used to investigate whether anxiety and depression could account for elevations in alexithymia. Multiple and univariate regression analyses were also performed to investigate the predictive ability of variables. Finally, in order to check the internal consistency of the CRQ, Pearson product moment correlation coefficients for the CRQ scales was calculated, and, to check concurrent validity, the relationship between this scale and the Parental Bonding Instrument was investigated.
3. RESULTS

3.1 Overview

The results are presented in three parts. The first section presents descriptive statistics relating to sample composition and group differences, including demographic information, body mass indices, as well as comparison of eating disorders and comparison groups for the standardized questionnaires used in the study. The means, frequency distributions, and results from t-tests, Chi-square analysis, and analysis of variance are presented. The second section presents the results from a series of correlation and regression analyses designed to test the hypothesized relationships between variables. Using regression analysis and multivariate analysis of covariance, the eating disorders and comparison groups were compared with respect to differences in strength of the various relationships. As some group differences could potentially be accounted for by confounding variables, some of the analyses were conducted on the full sample without a grouping variable. The final section presents post-hoc analyses, including multiple regression, performed to further explore the hypothesized relationships between parental bonding, alexithymia, adult attachment dimensions and eating disorder symptomatology. New groups were defined and analysed for group differences.

An alpha level of $p < .05$ was set for all statistical tests.

3.2 Evaluation of the Eating Disorders and Comparison Groups

3.2.1 Descriptive statistics

**Age**

The age range for the women in the eating disorder group was somewhat larger than the age range in the comparison group, although group means for age were similar (see Figure 3 for distribution). The age of participants in the eating disorder group ranged from 17 to 60 years with a mean of 28.1 years ($SD = 10.25$), while the age range for the
comparison group was 17 to 35 years with a mean of 26.9 years (SD = 4.44). The difference in group means was not statistically significant at the p < .05 level, using a two-tailed t-test (t(33) = 2.03).

Figure 3: Age Profile of Eating Disorders Group versus Comparison Group

Education

Education levels for the sample ranged from high school level to PhD (see Figure 4). All tertiary level qualifications, including graduate and post-graduate, were collapsed into a class entitled ‘tertiary’. The ratio of high school to tertiary qualified participants in the two groups was then analysed using a chi-square analysis, which confirmed that the education level of the comparison group was significantly higher than that of the eating disorder group (χ²(1, 102) = 9.42, p < .01).

Figure 4: Education Level of Eating Disorders Group Versus Comparison Group


*Ethnicity*

The majority of the sample identified themselves as European in origin. In the eating disorders group, one woman identified herself as Maori, and 27 women identified themselves as European. In the comparison group, two women identified themselves as Maori, four as ‘other’ and the remaining 70 women identified themselves as European. One woman in the eating disorders group and seven women in the comparison group neglected to identify their ethnicity. Subsequent statistical analysis was collapsed across ethnic groups because there were insufficient numbers of non-European women to conduct separate analyses.

![Ethnicity Chart]

*Figure 5: Ethnicity of Eating Disorders Group Versus Comparison Group*

*Body Mass Index*

Body Mass Index (BMI), a widely accepted measure of adiposity, is calculated by dividing weight by height$^2$ (i.e. kg/m$^2$). Although there were slightly different distributions of Body Mass Indices for the eating disorders versus comparison groups, group means were remarkably similar (eating disorders group $M = 21.5$, $SD = 6.5$; comparison group $M = 23.6$, $SD = 4.1$). A two tailed $t$-test confirmed that the difference between means was not statistically significant ($t(38) = 2.02$, $p > .05$, n.s.).

3.2.2 *Group differences with respect to scales*

A series of $t$-tests for independent means (two-tailed) were conducted to investigate differences in means between the two groups on all measures (see Table 1). In summary,
statistically significant group differences were found on all measures, including all subscales with the exception of the externally oriented thinking subscale of the TAS-20.

Table 1.

Eating Disorders Group and Comparison Group Means and Standard Deviations for Measures and Subscales

<table>
<thead>
<tr>
<th>Measure: subscale</th>
<th>Eating Disorders Group</th>
<th>Comparison Group</th>
<th>t-value (df)</th>
<th>Two-tailed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>Mean</td>
<td>(SD)</td>
<td>N</td>
</tr>
<tr>
<td>TAS-20 : Total</td>
<td>30</td>
<td>59.77</td>
<td>(13.79)</td>
<td>83</td>
</tr>
<tr>
<td>DIF</td>
<td>30</td>
<td>24.77</td>
<td>(6.51)</td>
<td>83</td>
</tr>
<tr>
<td>DDF</td>
<td>30</td>
<td>15.67</td>
<td>(5.19)</td>
<td>83</td>
</tr>
<tr>
<td>EOT</td>
<td>30</td>
<td>19.33</td>
<td>(4.89)</td>
<td>83</td>
</tr>
<tr>
<td>PBI Maternal care</td>
<td>29</td>
<td>23.03</td>
<td>(9.68)</td>
<td>83</td>
</tr>
<tr>
<td>Maternal O/P</td>
<td>29</td>
<td>18.90</td>
<td>(9.97)</td>
<td>83</td>
</tr>
<tr>
<td>Paternal care</td>
<td>28</td>
<td>17.86</td>
<td>(9.64)</td>
<td>78</td>
</tr>
<tr>
<td>Paternal O/P</td>
<td>28</td>
<td>16.43</td>
<td>(9.12)</td>
<td>78</td>
</tr>
<tr>
<td>CRQ Avoidance</td>
<td>30</td>
<td>65.33</td>
<td>(20.97)</td>
<td>82</td>
</tr>
<tr>
<td>Anxiety</td>
<td>30</td>
<td>72.93</td>
<td>(18.30)</td>
<td>82</td>
</tr>
<tr>
<td>STAI State</td>
<td>30</td>
<td>51.63</td>
<td>(14.39)</td>
<td>83</td>
</tr>
<tr>
<td>Trait</td>
<td>30</td>
<td>59.17</td>
<td>(13.00)</td>
<td>83</td>
</tr>
<tr>
<td>BDI-II</td>
<td>30</td>
<td>28.20</td>
<td>(17.87)</td>
<td>83</td>
</tr>
</tbody>
</table>

Probability; p < .05; ** p < .01; *** p < .001; Two-tailed t-tests for independent means. Maternal O/P = Maternal overprotection; Paternal O/P = Paternal overprotection.

Alexithymia

Using a cut-off score of ≥ 61 as recommended by Taylor and colleagues (Taylor, 1996), the rate of alexithymia in the eating disorders group was 53 per cent (n = 16), which was higher than the comparison group rate of 13 per cent (n = 11).

A comparison of group means indicated that the eating disorders group was more highly alexithymic than the control group with respect to total alexithymia score. A two-tailed t-test confirmed that the total alexithymia score (TAS-20 total) for the eating disorders group was significantly higher than the total alexithymia score for the comparison group (TAS-20 total: eating disorders group M = 59.77, SD = 13.79; comparison group M = 44.28, SD = 12.47; t(47)= 2.01, p < .01). Further investigation
showed that significant group differences were observable in two of the three TAS-20 subscales: *difficulty identifying feelings* (DIF: eating disorders group $M = 24.77$, $SD = 6.51$; comparison group $M = 14.66$, $SD = 6.76$; $t(53) = 2.005$, $p < .01$), and *difficulty describing feelings* (DDF: eating disorders group $M = 15.67$, $SD = 5.19$; comparison group $M = 11.26$, $SD = 4.63$; $t(47) = 2.01$, $p < .01$). However, the groups were similar with respect to the third subscale, *externally oriented thinking* (EOT: eating disorders group $M = 19.33$, $SD = 4.89$; comparison group $M = 18.35$, $SD = 4.35$; $t(47) = 2.01$, $p > .05$, n.s.).

*Interaction between education and alexithymia*

In some studies, alexithymia has been found to covary with education level, with lower rates of alexithymia found amongst more highly educated groups (Kirmayer et al., 1993; Taylor, 1997). Given there were significant differences in education level between the eating disorders and comparison groups in the present study, it was important to investigate education level as a possible confound. A two-way analysis of variance (ANOVA) for uneven groups was conducted to test whether alexithymia varied with education level and group. Wilks test confirmed that there was no interaction between education and group but a main effect was revealed for education level ($F(3,20) = 5.48$, $p < .01$). Univariate analysis revealed a statistically significant relationship between education level and scores on two of the TAS-20 subscales, *difficulty describing feelings* (DDF) and *externally oriented thinking* (EOT), and with TAS-20 *total* scores: in each case higher alexithymia scores were associated with lower education (*TAS-20 total*: $F(1,22) = 7.08$, $p < .01$; $DDF$: $F(1,22) = 5.58$, $p < .05$; $EOT$: $F(1,22) = 13.64$, $p < .001$).

Given the categorical nature of the education data, this variable could not be included in subsequent analyses using continuous data. Without controlling for group differences in education level, education could not be eliminated as a possible confound, even though no education by group interaction had been found.

*Parental bonding*

The Parental Bonding Instrument (PBI) generates two scores for each parent representing *care* and *overprotection* dimensions of parenting style. A series of two-tailed t-tests revealed statistically significant differences between the two groups on both dimensions of parenting, with the same pattern of differences for both parents. Compared
with the comparison group, the eating disorders group had lower maternal care scores (eating disorders group $M = 23.03$, $SD = 9.68$; comparison group $M = 27.59$, $SD = 7.80$, $t(41) = 2.02$, $p < .05$), and higher maternal overprotection scores (eating disorders group $M = 18.90$, $SD = 9.97$; comparison group $M = 11.86$, $SD = 6.57$, $t(37) = 2.03$, $p < .001$). Similarly, paternal care scores were lower for the eating disorders group (eating disorders group $M = 17.86$, $SD = 9.64$; comparison group $M = 23.06$, $SD = 10.03$, $t(49) = 2.01$, $p < .05$), while paternal overprotection scores were higher (eating disorders group $M = 16.43$, $SD = 9.12$; comparison group $M = 11.28$, $SD = 7.56$, $t(41) = 2.02$, $p < .01$). This confirms that a pattern of optimal bonding is more common in the comparison group compared with the eating disorders group.

**Attachment Dimensions in Adulthood**

The Close Relationships Questionnaire (CRQ) generates two scale-scores that represent the hypothesized dimensions of adult attachment: avoidance and anxiety. This new scale lacks validation and so there was some uncertainty as to whether it would differentiate the two groups. However, two-tailed t-tests revealed statistically significant differences between group means for both avoidance and anxiety scores, and in a direction that was consistent with the hypothesized differential in attachment dimensions for each of the two groups. In summary, the eating disorders group scored higher than the comparison group on both avoidance and anxiety subscales (Avoidance subscale: eating disorders group $M = 65.33$, $SD = 20.97$, comparison group $M = 49.10$, $SD = 14.06$, $t(39) = 2.02$, $p < .001$; Anxiety subscale: eating disorders group $M = 72.93$, $SD = 18.30$, comparison group $M = 46.80$, $SD = 11.91$, $t(79) = 1.99$, $p < .001$). This pattern suggests that, on the whole, participants in the eating disorders group were less securely attached than participants in the comparison group.

**Depression**

Although the BDI-II is not in itself diagnostic, the range of BDI-II scores for each group suggested a likely presence of individuals with severe depression in both groups. However, the range of scores was somewhat greater in the eating disorders group (range of 1 to 59) than the comparison group (range of 0 to 39), and the mean BDI-II score in the eating disorders group was in the ‘severely depressed’ range, while the mean score in the comparison group was in the ‘minimal depression’ range. A two-tailed t-test revealed a
statistically significant difference in group means, confirming that, on the whole, the eating disorder group reported higher levels of depression that the control group (eating disorders group $M = 28.20$, $SD = 17.87$, comparison group $M = 8.63$, $SD = 8.33$, $t(34) = 2.03$, $p < .0001$).

**Anxiety**

The State-Trait Anxiety Inventory (STAI) generates two scores that correspond with the *state* (AX/state) and *trait* (AX/trait) subscales. A comparison of mean scores indicated that members of the eating disorders group reported being more anxious on the day of testing, as well as generally more anxious, than members of the comparison group (*AX/state*: eating disorders group $M = 51.63$, $SD = 14.39$, comparison group $M = 35.13$, $SD = 11.05$; *AX/trait*: eating disorders group $M = 59.17$, $SD = 13.00$, comparison group $M = 39.85$, $SD = 10.06$). Two-tailed $t$-tests confirmed that these differences were statistically significant ($t(42) = 2.01$, $p < .0001$).

**Disordered eating attitudes and associated psychological themes:**

The Eating Disorders Inventory – second edition (EDI-2) includes eight validated subscales and three provisional subscales. Of the validated subscales, three represent eating attitudes and behaviours and concerns with body image, all of which are associated with eating disorder symptomatology. The remaining five validated subscales and the three new subscales represent more general organizing constructs that have been linked with eating disorders.

Given the eating disorders group included women receiving treatment for diagnosed eating disorders, a not unexpected finding was that there were statistically significant differences between the two groups on the EDI-2 subscales representing eating attitudes and behaviours, and body image. The eating disorders group had higher scores than the comparison group on all three subscales (*drive for thinness*: eating disorders group $M = 14.7$, $SD = 6.1$, comparison group $M = 3.6$, $SD = 4.7$, $t(42) = 2.02$, $p < .001$; *bulimia*: eating disorders group $M = 7.2$, $SD = 5.7$, comparison group $M = 1.2$, $SD = 2.1$, $t(32) = 2.04$, $p < .001$; and *body dissatisfaction*: eating disorders group $M = 19.3$, $SD = 8.2$, comparison group $M = 10.0$, $SD = 7.8$, $t(49) = 2.01$, $p < .001$). This pattern of statistically significant higher mean scores for the eating disorders versus the comparison group was consistent.
and extended across all EDI-2 subscales, including the three provisional subscales (see Table 2), and indicated that disordered eating attitudes and behaviours and associated psychological themes were more predominant in the eating disorders group.

Table 2.

**Eating Disorders Group and Comparison Group Means and Standard Deviations for EDI-2 Subscales**

<table>
<thead>
<tr>
<th>EDI-2 Subscale</th>
<th>Eating disorders group Means (SD) (N=30)</th>
<th>Comparison group Means (SD) (N=83)</th>
<th>t value (df) two-tailed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drive for thinness</td>
<td>14.7 (6.1)</td>
<td>3.6 (4.7)</td>
<td>t(42) = 2.02 ***</td>
</tr>
<tr>
<td>Bulimia</td>
<td>7.2 (5.7)</td>
<td>1.2 (2.1)</td>
<td>t(32) = 2.04 ***</td>
</tr>
<tr>
<td>Body dissatisfaction</td>
<td>19.3 (8.2)</td>
<td>10.0 (7.8)</td>
<td>t(49) = 2.01 ***</td>
</tr>
<tr>
<td>Ineffectiveness</td>
<td>13.5 (8.5)</td>
<td>2.1 (3.1)</td>
<td>t(32) = 2.03 ***</td>
</tr>
<tr>
<td>Perfectionism</td>
<td>8.1 (5.3)</td>
<td>3.7 (3.5)</td>
<td>t(39) = 2.02 ***</td>
</tr>
<tr>
<td>Interpersonal Distrust</td>
<td>5.7 (4.5)</td>
<td>1.6 (2.5)</td>
<td>t(35) = 2.03 ***</td>
</tr>
<tr>
<td>Interoceptive Awareness</td>
<td>12.0 (8.2)</td>
<td>1.9 (3.5)</td>
<td>t(33) = 2.03 ***</td>
</tr>
<tr>
<td>Maturity Fears</td>
<td>6.2 (5.9)</td>
<td>2.5 (2.8)</td>
<td>t(34) = 2.03 **</td>
</tr>
<tr>
<td>Asceticism</td>
<td>10.1 (6.3)</td>
<td>2.7 (1.7)</td>
<td>t(31) = 2.04 ***</td>
</tr>
<tr>
<td>Impulse Control</td>
<td>6.9 (6.0)</td>
<td>2.3 (3.8)</td>
<td>t(37) = 2.02 ***</td>
</tr>
<tr>
<td>Social Insecurity</td>
<td>8.7 (5.0)</td>
<td>3.0 (2.6)</td>
<td>t(35) = 2.03 ***</td>
</tr>
</tbody>
</table>

Probability: ** p < .002; *** p < .001
Two-tailed t-tests for independent means

3.3 Associations Between Variables

This section reports a series of analyses investigating association between variables. These include: an analysis of group differences in alexithymia, controlling for depression, anxiety and age; an investigation of the relationships between the PBI, CRQ and TAS-20; and, an analysis of the relationship between parental bonding, adult attachment dimensions, alexithymia, and the EDI subscales (entering EDI subscales as dependent variables) while controlling for the effects of the possible confounds: depression, anxiety and age.
3.3.1 Group differences in alexithymia: an investigation to assess depression and anxiety as potential confounds

A number of studies report that high rates of alexithymia found in eating disorder samples may be related to the presence of depression. Indeed, it has been suggested that the increased prevalence of alexithymia found in eating disorder samples cannot be interpreted without taking depression into account (Corcos et al., 2000). A weak association between alexithymia scores and age is also reported in the literature, with some studies reporting that alexithymia scores show a tendency to decrease with age, and others reporting the opposite. Although the previous t-test for age had shown no significant group difference in means, age was included as a covariate in analysis as a precautionary measure, together with scores for depression and anxiety, hypothesized to be confounding variables.

The first step in investigating the relationship between depression and alexithymia scores in the present study was to generate Pearson product moment correlations, and this confirmed that, in the full sample, BDI-II and TAS-20 total scores were significantly positively correlated with each other (\( N = 113, r = .69, p < .05 \)). In fact, depression scores were found to be positively correlated with all three alexithymia subscales: the largest correlation was with difficulty identifying feelings (\( DIF: r = .73, p < .05 \)), followed by difficulty describing feelings (\( DDF: r = .58, p < .05 \)), and externally oriented thinking (\( EOT: r = .25, p < .05 \)).

In order to test whether there were group differences in alexithymia scores after controlling for depression, anxiety, and age, a 2 (group: eating disorders/comparison) × 4 (alexithymia scores: \( DIF/ DDF/ EOT/ TAS \ total \)) multivariate analysis of covariance (MANCOVA) was conducted with covariates of BDI-II, STAI state, STAI trait, and age. After controlling for the effects of depression, anxiety and age, Wilks’ test revealed no main effect for group (\( F(3,105) = 1.69, p > .05, \text{ n.s.} \)), suggesting that elevated levels of alexithymia in the eating disorders group compared with the comparison group could be accounted for by the covariate measures. Indeed, depression, anxiety and age accounted for more than half of the variance for TAS-20 total (\( R^2 = .54, p < .001 \)). However, the
amount of variance explained for each of the TAS-20 subscales varied, with the greatest amount of variance accounted for found in the difficulty identifying feelings subscale ($R^2 = .61, p < .001$), followed by the difficulty describing feelings subscale ($R^2 = .43, p < .001$), while very little variance was explained for by the externally oriented thinking subscale ($R^2 = .07, p < .05$).

In the overall model, a strong association was revealed between trait anxiety scores and both the TAS-20 total scores and TAS-20 subscale scores. Univariate analysis identified a relationship between trait anxiety and difficulty identifying feelings scores ($F(1,107) = 9.05, p < .01$), trait anxiety and difficulty describing feelings scores ($F(1,107) = 20.12, p < .001$), as well as trait anxiety and the TAS-20 total scores ($F(1,107) = 16.42, p < .001$). An association was also found between the BDI-II and difficulty identifying feelings scores ($F(1,107) = 4.14, p < .05$). The effect of age on alexithymia was not statistically significant and so age was dropped as a covariate from further analysis.

One study that used LISREL modeling found inter-relationships between depression, state anxiety and the dimensions of alexithymia (Haviland et al., 1994). Specific findings were that depression predicted alexithymia, and state anxiety predicted both depression and alexithymia. In the present study, statistically significant large positive correlations were found between state anxiety and trait anxiety and depression scores, providing partial support for Haviland and colleagues’ finding that these constructs are related (Haviland et al., 1994). Specifically, trait anxiety correlated highly and positively with state anxiety (Pearson product moment correlations: $N = 113; r = .83, p < .05$), and both state and trait anxiety were highly positively correlated with depression scores (STAI trait vs BDI-II: $r = .84$; STAI state vs BDI-II $r = .78, p < .05$).

3.3.2 Relationship between parental bonding, adult attachment style and alexithymia

In order to investigate the relationship between parental bonding, adult attachment style, and alexithymia, PBI, CRQ and TAS-20 scores were analysed without a grouping variable, on the basis that the respective constructs are considered to be continuously distributed in the population, and there was no group difference in TAS-20 scale scores after controlling for anxiety and depression.
Association between parental bonding and dimensions of adult attachment

Although the PBI was not intended to be used as a measure of attachment, the construct of parental bonding is aligned with the construct of attachment (Parker, 1990; Parker et al., 1979). The CRQ, on the other hand, was designed and constructed with measurement of the major dimensions of adult attachment in mind. It was hypothesized that, given the PBI purports to measure parental characteristics closely associated with the development of attachment style, and provided the CRQ is a valid measure of adult attachment dimensions, then the scales of the CRQ should show some degree of correlation with PBI subscales.

In order to investigate whether parental bonding and the avoidance and anxiety dimensions of adult attachment are associated, Pearson product moment correlations were computed for PBI and CRQ subscales using the full sample. The results are summarized in Table 3. This analysis is of value at several different levels. Firstly, the pattern of the relationships between the subscales within each instrument is of interest because, according to the literature, this corresponds with attachment style. Secondly, the relationship between the two instruments is of interest because this would support continuity of attachment style from childhood through to adulthood. Additionally, a correlation between the two scales of the CRQ would provide evidence of internal consistency, and would suggest a degree of reliability of this measure, while a correlation between the two instruments, the CRQ and PBI, would provide evidence of concurrent validity.
Table 3: Pearson Product Moment Correlations between Parental Bonding Instrument (PBI) subcales and Close Relationship Questionnaire (CRQ) subscales.

<table>
<thead>
<tr>
<th></th>
<th>PBI Maternal care</th>
<th>PBI Paternal care</th>
<th>PBI Maternal overprotection</th>
<th>PBI Paternal overprotection</th>
<th>CRQ Avoidance</th>
<th>CRQ Anxiety</th>
</tr>
</thead>
<tbody>
<tr>
<td>PBI</td>
<td>1.00</td>
<td>.35</td>
<td>-.40</td>
<td>-.33</td>
<td>-.48</td>
<td>-.41</td>
</tr>
<tr>
<td>Maternal care</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PBI</td>
<td>.35</td>
<td>1.00</td>
<td>-.18</td>
<td>-.56</td>
<td>-.33</td>
<td>-.26</td>
</tr>
<tr>
<td>Paternal care</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PBI</td>
<td>-.40</td>
<td>-.18</td>
<td>1.00</td>
<td>.41</td>
<td>.37</td>
<td>.42</td>
</tr>
<tr>
<td>Maternal overprotection</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PBI</td>
<td>-.33</td>
<td>-.56</td>
<td>.41</td>
<td>1.00</td>
<td>.28</td>
<td>.34</td>
</tr>
<tr>
<td>Paternal overprotection</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CRQ</td>
<td>-.48</td>
<td>-.33</td>
<td>.37</td>
<td>.28</td>
<td>1.00</td>
<td>.62</td>
</tr>
<tr>
<td>Avoidance</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CRQ</td>
<td>-.41</td>
<td>-.26</td>
<td>.42</td>
<td>.34</td>
<td>.62</td>
<td>1.00</td>
</tr>
<tr>
<td>Anxiety</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Pearson product moment correlations (N=105); All correlations reported are significant at p<.05.

Firstly, analysis of each instrument’s internal relationships revealed that the maternal care and paternal care dimension of the PBI, as well as the maternal overprotection and paternal overprotection dimension, showed moderate positive correlations (N=105; care scales r = .35; overprotection scales r = .41, p < .05). This suggests that participants reported experiencing relative consistency between their mother and father with respect to parenting style. Comparison of the care dimension with the overprotection dimension showed a moderate negative correlation for both maternal and paternal scores (maternal care vs. maternal overprotection r = -.40; paternal care vs. paternal overprotection r = -.56, p < .05), which suggests that parents who were perceived as loving and caring were less likely to be perceived as overprotective. On the other hand, parents who were perceived as indifferent were more likely to be perceived as overprotective. This pattern indicates that there was a gradient of parental bonding experiences within the sample. The CRQ subscales, avoidance and anxiety, were positively correlated (r = .62, p < .05), which reflects variation in the attachment dimensions in the sample and also provides some support for the internal consistency of this instrument.
Secondly, comparing the PBI and CRQ measures, all PBI subscales were significantly correlated with the CRQ subscales, and in expected directions. For instance, both maternal and paternal care dimensions of parental bonding showed significant negative correlations with both CRQ dimensions, avoidance and anxiety ($n=105$; maternal care vs. CRQ avoidance $r = -0.48$; paternal care vs. CRQ avoidance $r = -0.33$; maternal care vs. anxiety $r = -0.41$; paternal care vs. CRQ anxiety $r = -0.26, p < .05$). Conversely, the overprotection dimensions of parental bonding were significantly positively correlated with CRQ avoidance and anxiety (maternal overprotection vs. CRQ avoidance $r = .37$; paternal overprotection vs. CRQ avoidance $r = .28$; maternal overprotection vs. CRQ anxiety $r = .42$; paternal overprotection vs. CRQ anxiety $r = .34, p < .05$). The pattern of correlation suggests that retrospectively reported optimal parental bonding was associated with less anxiety and avoidance or, in other words, a secure attachment style with respect to close relationships in adulthood. Maternal care and overprotection correlations with CRQ scales were stronger than paternal care and overprotection correlations with CRQ scales, possibly indicating that maternal parenting has a more substantial influence on attachment dimensions in later life.

A multiple regression was conducted to further investigate the relationship between parental bonding and adult attachment dimensions. Entering PBI subscales as predictor variables for CRQ scales, Wilks’ test revealed a relationship between PBI maternal care and the CRQ ($F(2,99) = 6.63, p < .01$), and PBI maternal overprotection and the CRQ ($F(2,99) = 3.99, p < .05$). Univariate analysis of predictors of the CRQ subscales revealed that PBI relationships with the CRQ were confined to maternal subscales of the PBI. A negative relationship was found between maternal care and CRQ avoidance ($\beta = -.34, p < .001$), as well as between maternal care and CRQ anxiety ($\beta = -.24, p < .05$). A positive relationship was revealed between maternal overprotection and CRQ avoidance ($\beta = .20, p < .05$), as well as between maternal overprotection and CRQ anxiety ($\beta = .27, p < .01$). It is worth noting, however, that the PBI accounted for a relatively small to moderate proportion of the variance in CRQ scores (CRQ avoidance: adjusted $R^2 = .27$; CRQ anxiety: adjusted $R^2 = .23, p < .001$).
Association between parental bonding and alexithymia

Alexithymia is hypothesized to develop as a result of problematic attachment relations in infancy (Taylor et al., 1997). In the present study, a multiple regression analysis of the PBI and TAS-20 scales was conducted, again without a grouping variable, to check whether parental bonding could predict alexithymia scores. Wilks' test revealed a main effect for maternal care and the TAS-20 scale (F(3,99) = 3.41, p < .05). It was apparent from univariate analysis that maternal care was the only dimension of the PBI to show a statistically significant relationship with alexithymia dimensions. Specifically, maternal care was negatively associated with two TAS-20 subscales: difficulty identifying feelings (β = -.24, p < .05), and difficulty describing feelings (β = -.34, p < .01), as well as TAS-20 total score (β = -.30, p < .01). Maternal care did not, however, appear to predict the TAS-20 subscale externally oriented thinking. The maternal overprotection dimension did not show an association with any of the alexithymia subscales. Neither paternal care nor paternal overprotection dimensions of parental bonding appeared to be significantly associated with alexithymia, although an unexpected positive association between paternal care and externally oriented thinking almost reached significance (β = .23, p = .059).

It should be noted that, although statistical significance was reached, parental bonding explained only a small proportion of the variance for TAS-20 total scores (R² = .14, p < .001), TAS-20 DIF scores (R² = .18, p < .001), and TAS-20 DDF scores (R² = .11, p < .01).

Association between parental bonding, adult attachment dimensions and alexithymia

Collapsing eating disorders and comparison groups again, and using data from the full sample, a multiple regression analysis was conducted to investigate the relationships between parental bonding, adult attachment dimensions and alexithymia. The PBI and CRQ measures were entered simultaneously as predictor variables for alexithymia subscales. Statistically significant relationships were revealed between PBI and CRQ measures and the TAS-20 total and all TAS-20 subscales. Specifically, the CRQ anxiety subscale predicted difficulty identifying feelings (β = .17, p < .001). Difficulty describing feelings was predicted by paternal care (β = .12, p < .01) and CRQ avoidance (β = .19, p < .001), and, similarly, externally oriented thinking was predicted by paternal care (β = .14, p < .01) and CRQ avoidance (β = .13, p < .001). While the CRQ relationships with
alexithymia subscales were in anticipated directions, the positive relationship identified between paternal care and alexithymia subscales was unexpected.

*Predictors of alexithymia, controlling for depression and anxiety*

A multiple regression analysis was conducted to identify relationships between parental bonding, dimensions of adult attachment, and the TAS-20 subscales without a grouping variable, and entering the BDI-II and STAI subscales as covariates. The overall model revealed a relationship between paternal care ($F(3,93) = 5.3, p < .01$), CRQ avoidance ($F(3,93) = 18.84, p < .001$), trait anxiety ($F(3,93) = 5.3, p < .01$) and alexithymia. Univariate analysis no longer revealed a relationship between CRQ anxiety and the first alexithymia factor, difficulty identifying feelings. Instead, trait anxiety predicted difficulty identifying feelings ($\beta = .41, p < .01$), and difficulty describing feelings ($\beta = .60, p < .001$); paternal care predicted difficulty describing feelings ($\beta = .25, p < .01$) and externally oriented thinking ($\beta = .32, p < .01$); CRQ avoidance predicted difficulty describing feelings ($\beta = .57, p < .001$), and externally oriented thinking ($\beta = .48, p < .001$). This pattern of results indicates that when depression and anxiety are controlled, the relationship between CRQ anxiety and difficulty identifying feelings is not longer significant. This relationship appears to be superceded by a relationship between trait anxiety and difficulty identifying feelings. Of particular interest, however, is that the relationship between paternal care and alexithymia, and CRQ and alexithymia remain.

With the PBI and CRQ, BDI-II and STAI entered together, the independent variables could explain over 60 percent of the variance in each of the difficulty identifying feelings and difficulty describing feelings subscales, and 16 percent of the variance in the externally oriented thinking subscale of the TAS-20 (DIF: Adjusted $R^2 = .61, F(9,95) = 19.27, p < .001$; DDF: Adjusted $R^2 = .61, F(9,95) = 18.86, p < .001$; EOT: Adjusted $R^2 = .16, F(9,95) = 3.24, p < .01$).

*Strength of relationship between parental bonding, attachment and alexithymia*

Comparing parental bonding and adult attachment dimensions, the latter, as measured by the CRQ, appeared to be the best predictor of alexithymia overall, with both CRQ subscales predicting the TAS-20 total score (avoidance: $\beta = .41, p < .001$; anxiety: $\beta = .19, p < .01$). Although the PBI and CRQ scales were moderately correlated, and both
showed relationships with alexithymia dimensions, from this analysis it would appear that, of the two scales, the CRQ has the stronger relationship with alexithymia.

Together, the PBI and CRQ scales could explain almost half of the variance in alexithymia (TAS-20 total: Adjusted $R^2 = .48$, $F(6,98) = 17.0$, $p < .001$). With respect to TAS-20 subscales, these measures could explain approximately 42 per cent of the variance in difficulty identifying feelings (Adjusted $R^2 = .42$, $F(6,98) = 13.3$, $p < .001$), approximately 52 per cent of the variance in difficulty describing feelings (Adjusted $R^2 = .052$, $F(6,98) = 19.5$, $p < .001$), and approximately 17 per cent of the variance in externally oriented thinking (Adjusted $R^2 = .17$, $F(6,98) = 4.59$, $p < .001$).
3.3.3 Relationship between all independent variables and EDI subscales (with EDI-2 subscales as the dependent variables)

As the previously identified group differences in alexithymia scores no longer reached statistical significance after controlling for depression, anxiety and age, the eating disorders and comparison groups were collapsed and a multiple regression analysis was conducted to investigate the relationships between independent variables and Eating Disorder Inventory – Second Edition (EDI-2) subscales in the full sample. The EDI-2 subscales were entered as dependent variables and the subscales for all other measures (PBI, CRQ, TAS-20, BDI-II, and STAI), plus age, were entered simultaneously as covariates.

A Wilks’ test revealed that several independent variables predicted EDI-2 subscales. In the overall model, a main effect was revealed between the BDI-II and EDI-2 subscales (Wilks’: $F(11,81) = 6.42, p < .001$), and between all three TAS-20 subscales and EDI-2 subscales (Wilks’: difficulty identifying feelings: $F(11,81) = 3.55, p < .001$; difficulty describing feelings: $F(11,81) = 3.55, p < .001$; externally oriented thinking: $F(11,81) = 2.1, p < .05$).

Univariate analysis identified the relationships between predictor variables (TAS-20, PBI, and CRQ subscales), covariates (BDI-II and STAI scales), and the EDI-2 subscales. These are shown graphically in Figure 6, however, a summary of key findings follows.

With regard to EDI-2 subscales that are considered central to eating disorder symptomatology, two independent associations were identified with two of the three EDI-2 subscales in this group. Firstly, the BDI-II was the only independent variable that showed a statistically significant positive relationship with drive for thinness (although the CRQ anxiety subscale almost reached significance: $\beta = .25, p = .053$), and, secondly, the TAS-20 difficulty identifying feelings subscale was the only predictor variable to show a significant positive relationship with bulimia ($\beta = .39, p < .05$). A number of predictor variables showed moderate but statistically significant positive relationships with the third EDI-2 subscale in this group, body dissatisfaction. These included the BDI-II ($\beta = .33, p < .05$), the CRQ anxiety subscale ($\beta = .30, p < .05$), and PBI paternal overprotection ($\beta = $
Additional relationships between *body dissatisfaction* and the PBI maternal subscales appeared to be contradictory. In contrast with *paternal overprotection*, *maternal overprotection* showed a statistically significant negative relationship with *body dissatisfaction* (β = -.23, p < .05), while a negative relationship between the PBI *maternal care* subscale and *body dissatisfaction* almost reached significance (β = -.20, p = .052).

With respect to the predictive ability of the predictor variables, regression analysis revealed that the BDI-II had multiple relationships with the EDI-2, predicting eight of the eleven EDI-2 subscales. Four of these relationships had positive Beta values over 0.50, including *drive for thinness* (β = .51, p < .01), *ineffectiveness* (β = .53, p < .001), *asceticism* (β = .74, p < .001), and *maturity fears* (β = .67, p < .001). The BDI-II relationships with the other four EDI-2 subscales, which included *body dissatisfaction*, *interoceptive awareness*, *impulse regulation*, and *social insecurity*, were moderate and positive.

The TAS-20 subscales were related to six of the EDI-2 subscales, although one of the relationships, between TAS-20 *difficulty identifying feelings* and *interoceptive awareness*, probably reflects the substantial overlap in items of these particular subscales and should, therefore, be discounted. In addition to the positive relationship with the *bulimia* subscale already discussed, the TAS-20 *difficulty identifying feelings* subscale showed a significant positive relationship with *impulse regulation* (β = .26, p < .05), and an unexpected negative relationship with *interpersonal distrust* (β = -.26, p < .05). The TAS-20 *difficulty describing feelings* subscale, in contrast, showed a significant, and fairly strong, positive relationship with *interpersonal distrust* (β = .47, p < .001), as well as a moderate, positive relationship with *social insecurity* (β = .26, p < .01). Only one statistically significant relationship was revealed for the third TAS-20 subscale *externally oriented thinking*, and that was a negative relationship with *perfectionism* (β = -.33, p < .01). Apart from TAS-20 *externally oriented thinking*, none of the other predictor variables appeared to be significantly related to this EDI-2 subscale.

In addition to relationships with the *body dissatisfaction* subscale already outlined, the PBI subscales showed two further relationships: *maternal overprotection* was positively related to *maturity fears* (β = .22, p < .05), and, in contrast, *paternal*
overprotection was negatively related to impulse regulation ($\beta = -.22$, $p < .05$). While the CRQ anxiety subscale relationships were confined to body dissatisfaction (and, possibly also, drive for thinness) as outlined above, the CRQ avoidance subscale was moderately and positively related to interpersonal distrust ($\beta = .28$, $p < .01$) and weakly but positively related to social insecurity ($\beta = .17$, $p < .05$).

Finally, the analysis did not reveal any relationships for the STAI state anxiety scale and EDI-2 subscales, but STAI trait anxiety was moderately and positively related to ineffectiveness ($\beta = .30$, $p < .05$), and social insecurity ($\beta = .26$, $p < .05$).

Figure 6: Relationships and beta weights for independent variables: alexithymia, parental bonding, adult attachment dimensions, depression and anxiety, and the EDI-2 subscales.
Figure 6. (continued)

Probability: * p < .05; ** p < .01; *** p < .001;  
a. Approached statistical significance (CRQ p = .053; PBI p = .051)  
b. Relationship due to substantial overlap between items of TAS-20 DIF subscale and EDI-2 Intercuisive awareness
The amount of variance in EDI-2 subscale scores that could be accounted for by the independent variables in the multiple regression analysis is summarised in Table 4. Together, the predictor variables, BDI-II, STAI, TAS-20, PBI, and CRQ, were able to explain more than half of the variance in *ineffectiveness, interpersonal distrust, Asceticism,* and *Social Insecurity.* More than half of the variance in *interoceptive awareness* could also be accounted for by the predictor variables, however, it should be noted that the TAS-20 included in this analysis has item-overlap with the *interoceptive awareness* subscale and is likely to be inflating the amount of variance accounted for with respect to this EDI-2 subscale.

Table 4. Amount of Variance in EDI-2 Subscale Scores That Can Be Accounted For By BDI-II, STAI, TAS-20, PBI, and CRQ entered together.

<table>
<thead>
<tr>
<th>EDI-2 Subscale</th>
<th>Variance: Adjusted R²</th>
<th>F (13,91)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drive for Thinness</td>
<td>.36</td>
<td>5.49</td>
</tr>
<tr>
<td>Bulimia</td>
<td>.22</td>
<td>3.21</td>
</tr>
<tr>
<td>Body Dissatisfaction</td>
<td>.34</td>
<td>5.05</td>
</tr>
<tr>
<td>Ineffectiveness</td>
<td>.79</td>
<td>30.40</td>
</tr>
<tr>
<td>Perfectionism</td>
<td>.26</td>
<td>3.75</td>
</tr>
<tr>
<td>Interpersonal Distrust</td>
<td>.70</td>
<td>19.61</td>
</tr>
<tr>
<td>Interoceptive Awareness</td>
<td>.62</td>
<td>14.14</td>
</tr>
<tr>
<td>Maturity Fears</td>
<td>.44</td>
<td>7.37</td>
</tr>
<tr>
<td>Asceticism</td>
<td>.57</td>
<td>11.50</td>
</tr>
<tr>
<td>Impulse Regulation</td>
<td>.47</td>
<td>8.21</td>
</tr>
<tr>
<td>Social Insecurity</td>
<td>.80</td>
<td>33.06</td>
</tr>
</tbody>
</table>

Probability: p < .001 for all EDI-2 subscales; N = 104.

EDI-2 = Eating Disorders Inventory - second edition, BDI-II = Beck Depression Inventory 2nd edition,
STAI = State-Trait Anxiety Inventory, TAS-20 = Toronto Alexithymia Scale – 20 items,
PBI = Parental Bonding Instrument, CRQ = Close Relationships Questionnaire.
3.4 Post-Hoc Analyses

A series of post hoc analyses were conducted to further examine the relationships between variables. In summary, this involved collapsing the eating disorders and comparison groups and forming new groups that were defined by applying a cut-off to scores on two of the EDI-2 subscales, drive for thinness and bulimia, in combination with a cut-off for body mass indices (BMI). The new disordered eating symptoms (disordered eating Sx) group was compared with all other participants who formed a comparison-2 group. The disordered eating Sx group was then divided into two subgroups, drive for thinness (D/T Sx) and bulimia (B/Sx), and these subgroups were analysed for differences with the comparison-2 group.

3.4.1 Redefining groups for further analysis

The redefinition of the groups seemed an appropriate course to take for further analysis because of uncertainty as to whether the original eating disorders and comparison groups were truly independent. Unfortunately, due to the relatively small number of individuals registered with the Eating Disorders Service, it had not been feasible to limit the eating disorders group to one type of eating disorder, and the absence of reliable diagnoses meant it was not feasible to group participants by eating disorder diagnosis for analysis. In the first instance, the original eating disorders group was known to be heterogeneous in terms of eating disorder diagnosis, severity of disorder, as well as stage of treatment (and, therefore, possibly, stage of recovery). Several of the women in this group were asymptomatic at time of testing and some did not have a clear diagnosis. The eating disorders group was comprised of women with anorexia nervosa (AN) (including both restricting (AN-R) and binge-purge (AN-B) subtypes), bulimia nervosa (BN), and women who did not meet the DSM-IV criteria to make a specific diagnosis of AN or BN, and were, therefore, given a diagnosis of eating disorder not otherwise specified (EDNOS).

Secondly, it was considered possible that there were undiagnosed eating-disordered individuals and sub-clinical cases within the control group. In western society there is emphasis on and preoccupation with weight, particularly amongst women. The DSM-IV estimates prevalence to be approximately 1 per cent for AN and up to 3 per cent for BN, however, the prevalence for subthreshold eating disorders is estimated to be much higher.
Community studies have provided empirical evidence for the presence of a significant subgroup of women in the general population who are preoccupied with body image and weight issues. For instance, Garner and Olmsted (1984) reported that 9 per cent of college-age women and 11 per cent of high-school girls scored above a cutoff score of 14 on the *drive for thinness* scale of the EDI. In a normative study of 1,373 high school students, Rosen, Silberg and Gross (Rosen, Silberg, & Gross, 1988) reported that 11 per cent of girls scored 14 and above on the *drive for thinness* subscale of the EDI, while Shore and Porter (1990) reported that 16 per cent of a non-patient group of 11-18-year-old females scored above 14 on this EDI subscale. Due to the research design in the present study, it had not been possible to apply exclusionary criteria at the recruitment stage by screening participants in the comparison group for the presence of eating disorders.

In the absence of reliable diagnoses in the eating disorders group, or ability to screen the comparison group for eating disorders, it was decided to examine the body mass indices of participants in both groups. Body mass Index (BMI) is defined as a height-normalized measure of adiposity, and is calculated by dividing weight by height$^2$ (Garrow & Webster, 1985). Importantly, an individual’s height to weight ratio is a key consideration in making an eating disorder diagnosis. As previously reported, the eating disorders group mean BMI was 21.5 (SD = 6.5), while the comparison group mean was 23.6 (SD = 4.1). A two-tailed t-test for independent means had indicated that the difference between group means was not statistically significant ($t(38) = 0.11, p > .05$, n.s.). Comparison of the BMI frequency distribution of the groups revealed that the eating disorders group had a greater range in BMI than the comparison group (see Figure 7). The finding that there were individuals in both the eating disorders and comparison groups whose BMI far exceeded the normal range of 20-25, suggested the possibility that both groups may have included individuals with a DSM-IV diagnosis of Binge Eating Disorder (BED). It was also clear that both the eating disorders and comparison groups included individuals with BMI scores well below the normal range. While BMI indices are by no means diagnostic, the presence of markedly underweight individuals in the comparison group suggested the possibility that this group may include some individuals with eating disorder symptomatology, specifically, some degree of the ‘restricting food’ features of anorexia nervosa and/or purging features.
In summary, the possibility of a degree of overlap between the groups with respect to eating disorder symptomatology could not be excluded and was strongly suggested by the distribution of BMI indices.

**Process for redefining groups for further analysis**

The original eating disorders and comparison groups were collapsed and individuals were reclassified. It was decided to define a new ‘disordered eating symptoms’ (disordered eating Sx) group on the basis of self-reported symptoms as measured by scores on two EDI-2 subscales, namely *drive for thinness* and *bulimia* subscales. Normative scores for these subscales show clear differentiation between eating disorder and college female samples. A third subscale that is described as core to eating disorders, *body dissatisfaction* was not included in the definition because most of the women in the sample scored highly on this scale. This is consistent with the literature, which suggests that the majority of women are dissatisfied with their body shape and weight. Importantly, this scale is not reliable in distinguishing eating disorder groups from non-eating disorder groups due to a large overlap in normative scores (Garner, 1991).

**Determining cutoff scores on the EDI-2 subscales: ‘Drive for thinness’ and ‘Bulimia’**

The EDI-2 manual recommends a score of 14 as an appropriate cutoff for the *drive for thinness* subscale since this score identifies approximately 10 per cent of college and high school females, 10 to 40 per cent of whom may be suspected as having clinically...
significant eating disorders (Garner, 1991). The EDI-2 manual also suggests that cut-off scores may be adjusted higher or lower depending on the purpose of screening. No recommendations are made with respect to other subscales. The EDI-2 manual also provides profiles of scores for eating disorder and college female samples. According to the profile, a score of 12 on the drive for thinness subscale and a score of 8 on the bulimia subscale represent the lower scores in the normative range for an eating disorders group. On this basis, these scores seemed appropriate cut-offs to use (see Appendix 12 for EDI-2 profile).

Rationale for applying a BMI exclusion criterion

The items in the bulimia subscale quite clearly relate to symptoms of bulimia nervosa, and, as individuals with bulimia nervosa can be overweight, an exclusion criterion of 'high BMI' was not considered necessary. The items in the drive for thinness subscale, on the other hand, do not exclusively relate to anorexia nervosa. Individuals who are overweight and who, on that basis, would not meet criteria for anorexia are likely to score highly on this subscale. In applying the drive for thinness cut-off, it was decided to exclude participants whose BMI suggested that they would not meet criteria for anorexia nervosa. A BMI of 22.5 is the halfway point through the normal range of 20 to 25. An exclusion criterion of BMI equal or greater to 23 was selected for use with a cut-off score of 12 for the drive for thinness subscale. In summary, the new disordered eating Sx group included participants who scored 12 or more on the drive for thinness subscale of the EDI-2 who had a BMI of less than 23, and participants who scored 8 or more on the bulimia subscale of the EDI-2.

In creating the new groups, five participants moved from the original eating disorders group into the new comparison-2 group, and two participants from the original comparison group moved into the new disordered eating Sx group. The new disordered eating Sx group included 11 participants who scored 12 and above on the drive for thinness subscale and had BMI's of less than 23 but scored below the cut-off for the bulimia subscale, and seven participants who scored 8 and above on the bulimia subscale but scored below 12 on the drive for thinness subscale. An additional nine participants scored above the cut-off on both drive for thinness and bulimia subscales, making a total of 27 participants in the new group. The new comparison group (comparison-2) numbered 86 and included all
remaining participants (i.e. all those who did not score above the cut-off on drive for thinness and/or bulimia subscales).

3.4.2 Education levels in the new groups

As education level had previously been identified as a possible confounding variable, the new groups were examined with respect to this variable and compared with the original grouping. Not unexpectedly, the frequency distribution of education level in each group reflected the high school versus tertiary ratio of the original eating disorder and comparison groups. That is, that, as a whole, the comparison-2 group was more highly educated than the disordered eating Sx group.

3.4.3 Group differences in alexithymia, controlling for depression and anxiety

In order to test whether there were group differences in alexithymia scores, after controlling for the confounding effects of depression and anxiety, a 2 (group: disordered eating Sx/comparison-2) x 4 (alexithymia scores: DIF/DDF/EOT/TAS-20 total) multivariate analysis of covariance (MANCOVA) was performed with covariates of BDI-II, STAI state and STAI trait. Age was not entered as a covariate because no effect for age had been identified in previous analyses. Even with the redefinition of groups and corresponding re-classification of participants, the results of this test mirrored the findings of analysis using the original groups: Wilks’ test revealed no main effect for group (F(3,106) = 1.16, p > .05, n.s.), suggesting that depression and anxiety could account for elevated alexithymia scores.

Both the overall model and univariate analysis revealed a pattern of relationships that was identical to the one revealed in analysis of the original grouping. There was a strong association between trait anxiety and alexithymia in the overall model, and univariate analysis identified a relationship between trait anxiety and difficulty identifying feelings, difficulty describing feelings and TAS-20 total scores, as well as a relationship between BDI-II depression and difficulty identifying feelings. No relationship was revealed for the third TAS-20 factor, externally oriented thinking.
Despite regrouping of participants, variance figures remained unchanged from the previous analysis. Depression and anxiety, measured by the BDI-II and STAI, accounted for more than half of the variance in TAS-20 total ($R^2 = .54$, $p < .001$). In terms of the TAS-20 subscales, depression and anxiety could explain most of the variance in difficulty identifying feelings ($R^2 = .61$, $p < .001$), a moderate amount of the variance in difficulty describing feelings ($R^2 = .43$, $p < .001$), but only a small amount of the variance in externally oriented thinking ($R^2 = .06$, $p < .05$).

### 3.4.4 Group differences in parental bonding

The two new groups were analysed for differences in pattern of parental bonding using a multivariate analysis of covariance (MANCOVA) technique in a 2 (group: disordered eating Sx/comparison-2) x 4 (parental bonding subscales) design, entering BDI-II and STAI state and STAI trait scales as covariates as a precautionary measure. Wilks test showed no main effect for group. However, in the overall model, a relationship was revealed between state anxiety and parental bonding ($F(4,98) = 2.48$, $p < .05$). Univariate analysis revealed a relationship between STAI state and one of the parental bonding subscales, maternal overprotection ($F(1,101) = 5.06$, $p < .05$). No other relationships were identified.

### 3.5 Subgroup differences in predictors of alexithymia

One final attempt was made to further refine the disordered eating Sx group. Two subsets of the disordered eating Sx group were created. The first was a bulimia symptoms subgroup (B/Sx), comprised of those participants scoring equal to or higher than 8 on the bulimia subscale of the EDI-2. The second was a drive for thinness subgroup (D/T Sx), comprised of participants who scored equal to or higher than 12 on the drive for thinness subscale of the EDI-2 and who had a BMI of less than 23. The groups were analysed separately with the comparison-2 group, which had been used in the earlier post-hoc analysis. The comparison-2 group was exclusive, including only those participants who were not in either of the two disordered eating subgroups.
A multivariate analysis of covariance (MANCOVA) was conducted for each of the disordered eating subgroups in a 2 (group) x 4 (TAS-20 subscales) design, with PBI, BDI-II and STAI scales entered as covariates. There was no main effect for group in either analysis, and in each case the overall model revealed a highly statistically significant relationship between trait anxiety and alexithymia (B/Sx/comparison-2: $F(3,84) = 5.48, p < .002$; D/T Sx/comparison-2: $F(3,89) = 5.86, p < .001$).

Univariate analysis, however, revealed a different pattern of relationships for each disordered eating subgroup. The pattern of relationships for the D/T Sx group was virtually identical to the pattern of relationships that had been revealed in regression analysis using the same variables to predict TAS-20 subscales without a grouping variable (see previous section, 'Predictors of alexithymia, controlling for depression and anxiety', for relationships between variables). The only difference in the D/T Sx group analysis was the presence of an additional statistically significant relationship for the D/T Sx group. The new positive relationship revealed was between paternal overprotection and externally oriented thinking ($F(1,91) = 4.36, p < .05$).

The pattern of statistically significant relationships in the B/Sx group was quite different to the D/T Sx group, and also differed from the pattern revealed in analysis of the full sample. In the B/Sx group, a statistically significant relationship was revealed between the BDI-II and difficulty identifying feelings ($F(1,86) = 6.50, p < .01$) that had not reached significance in the D/T Sx group, and had not been identified in the regression analysis of the whole sample. Also, in the B/Sx group analysis, several relationships between variables that were statistically significant in the D/T Sx group and the full sample analyses no longer reached significance. For instance, the relationship between paternal care and difficulty describing feelings did not reach significance ($F(1,86) = 3.48, p < .065$), nor did the relationship between paternal care and externally oriented thinking ($F(1,86) = 2.43, p < .12$). Finally, in contrast with the D/T Sx group analysis, the relationship between paternal overprotection and externally oriented thinking was not significant ($F(1,86) = 1.39, p < .24$).
The contrasting pattern of statistically significant relationships between variables for each of the disordered eating subgroups, D/T Sx and B/Sx, when compared with the full sample, suggests that there may be differences between these two disordered eating groups. It should be noted that the size of the two disordered eating subgroups was relatively small, the D/T Sx group included 18 participants, the B/Sx group included 13 participants, while the comparison-2 group included 82 participants. Therefore, the results of this analysis should be interpreted with caution.
4.0 DISCUSSION

As a general statement, all hypotheses outlined in the introduction were supported by the results of this study. There are some specific implications relating to some of the findings, however, that need to be considered separately.

4.1 The Origins of Alexithymia: Implications of Insecure Attachment

The origins of alexithymia are hypothesized to lie in impaired emotional development resulting from problematic attachment relationships in infancy. There has been surprisingly little research dedicated to testing this causal model. It has also been proposed that attachment bonds formed early in childhood form a prototype for later relationships (Bowlby, 1977). Although high rates of continuity of attachment have been demonstrated throughout childhood (Waters, 1978), the recency of adult attachment measures has precluded the longitudinal study required to fully test the hypothesized continuity of attachment style through the lifespan. The present study employed measures of parental bonding and adult attachment to investigate the hypothesized relationships between attachment and alexithymia.

The main finding of this study is that, as a corollary of early attachment relations, retrospectively reported sub-optimal parental bonding in childhood can predict alexithymia in adulthood. Significant relationships were also found between parental care and overprotection characteristics and adult attachment, and between adult attachment dimensions and alexithymia, which provides support for the thesis that difficulty in early attachment relations is implicated in the impaired emotional development identified with alexithymia, and that there is some continuity of these problematic phenomena through the lifespan.
4.1.1 Attachment

Validity of the PBI and CRQ measures

The results of this study demonstrate the ability of the PBI and CRQ instruments to assess parental bonding and attachment, respectively, as dimensional constructs. The positive, moderate correlation between the two subscales of the CRQ provides evidence of internal consistency, and suggests a degree of reliability of this measure, while the correlations between the subscales of the two instruments, the CRQ and PBI, provide evidence of concurrent validity of these measures.

Insecure attachment style in the eating disorders group

The pattern of relationships between the subscales within each of the instruments can be taken to correspond with attachment style. In the full sample, the care dimension of the PBI was moderately and negatively correlated with the overprotection dimension for both the maternal and the paternal subscales. This correlation suggests that parents who are experienced as loving and caring tend also to be experienced as less overprotective. In contrast, parents who are characterized as unaffectionate and indifferent are more likely to be also experienced as controlling and intrusive. This pattern indicates that there was a gradient, or spectrum, of parental bonding experiences within the sample. The CRQ avoidance and anxiety subscales were positively and moderately correlated, and, as with the PBI, this can be taken to reflect dimensional variation in reported adult attachment in the sample.

With respect to parental bonding, a pattern of optimal bonding (Parker et al., 1979) was more prevalent in the comparison group than in the eating disorders group, as predicted. This pattern applied to both parents. That is, relative to the comparison group, the eating disorders group had lower maternal care scores and higher maternal overprotection scores. Similarly, paternal care scores were lower for the eating disorders group while paternal overprotection scores were higher. The finding that levels of optimal parental bonding were lower in the eating disorders group than the comparison group provides some support for the findings of the two studies reported in the literature, although the present study used a different measure of experiences in attachment relationships in childhood than either of those. For instance, Kenny and Hart (1992), using
the EDI and the Parental Attachment Questionnaire, found that, compared to a college sample, female eating disorder patients reported being less securely attached to their parents, and Cole-Detke et al., 1996), using the Adult Attachment Interview, found that self-reported eating disorder symptoms in college women was related to reports of unresponsive parenting in early childhood.

With respect to adult attachment, in the whole sample the CRQ avoidance and anxiety subscales were moderately correlated which suggests that a participant who reported feeling secure (low levels of anxiety) in close interpersonal relationships was more likely to report a tendency to seek rather than to avoid intimacy in close relationships. Statistically significant differences were found between the eating disorders and comparison groups for both avoidance and anxiety in close relationships, and in a direction that was consistent with the hypothesized difference in attachment dimensions for each of the two groups. On the whole, participants in the eating disorders group reported being more anxious and avoidant, in other words, less securely attached in close relationships in adulthood, than participants in the comparison group.

The concurrent finding in the eating disorders group of higher levels of avoidance and anxiety in close relationships, measured by the CRQ, and lower levels of optimal bonding, measured by the PBI, provides strong evidence that the eating disorders group was characterized by patterns of less secure attachment than the comparison group. This finding provides support for a greater prevalence of insecure attachment styles found in eating disorder samples (Kenny et al., 1992; Tricholo, 1998).

**Continuity of attachment**

The present study extends previous research by finding a relationship between retrospectively reported sub-optimal parental bonding in childhood and insecure adult attachment, thereby demonstrating continuity of attachment. Comparing the PBI and CRQ measures, all dimensions of parental bonding were significantly correlated with the dimensions of adult attachment, and in expected directions. For instance, both maternal and paternal care dimensions of parental bonding showed significant negative correlations with the CRQ dimensions, avoidance and anxiety. Conversely, the maternal and paternal overprotection dimensions of parental bonding were significantly positively correlated
with CRQ avoidance and anxiety. The pattern of correlations suggest that reports of optimal parental bonding in childhood were associated with reports of less anxiety and avoidance or, in other words, a secure attachment style with respect to close relationships in adulthood. In contrast, reports of sub-optimal parental bonding in childhood were associated with reports of an insecure attachment style in adulthood. In sum, the pattern of relationships demonstrated between the two instruments, while not conclusive, supports the notion of continuity of attachment style from childhood through to adulthood.

It was predicted that parental bonding and adult attachment would be related constructs, however, considering that the PBI measures perceived characteristics of parental caregiving in childhood and the CRQ measures attachment style in close relationships in adulthood, it is worth noting that the PBI accounted for a surprisingly high, though moderate, proportion of the variance in CRQ scores (CRQ avoidance: 27%; CRQ anxiety: 23%).

With respect to parental bonding and adult attachment style, two additional findings are worthy of mention. Firstly, the results of this study suggest consistency between parents in parenting style characteristics for both eating disorders and comparison groups. Analysis of the PBI instrument’s internal relationships revealed that maternal care was moderately and positively correlated with the paternal care dimension of the PBI, and that maternal overprotection was moderately and positively correlated with the paternal overprotection dimension. This means that a participant who reported characteristics of low level of care and high level of overprotection from her mother was likely to report the same characteristics of parenting from her father.

Secondly, the results of this study suggest that characteristics of the mother’s parenting have a greater influence on adult attachment style than the characteristics of paternal parenting. This is consistent with original conceptualizations of attachment (Ainsworth et al., 1978; Bowlby, 1977), and makes intuitive sense, since, of both parents, the mother is usually the primary caregiver. The evidence for this was found in correlations between the PBI and the CRQ subscales, and in multiple regression. The maternal care and overprotection correlations with CRQ scales were stronger than paternal care and overprotection correlations with CRQ scales. Multiple regression, with
PBI subscales entered as predictor variables for CRQ scales, revealed that PBI relationships with the CRQ were confined to maternal subscales of the PBI. A negative relationship was found between maternal care and CRQ avoidance, as well as between maternal care and CRQ anxiety. A positive relationship was revealed between maternal overprotection and CRQ avoidance, as well as between maternal overprotection and CRQ anxiety.

4.1.2 Attachment, alexithymia, and sex of parent

Alexithymia is hypothesized to develop as a result of problematic attachment relations in infancy (Taylor et al., 1997). The present study provides empirical support for this proposition by finding that parental bonding, as a corollary of attachment in childhood, could predict alexithymia in the full sample. In entering the PBI subscales as predictor variables for the TAS-20 subscales, however, maternal care was the only dimension of the PBI to show a statistically significant predictive relationship with alexithymia dimensions. Specifically, maternal care was negatively associated with two TAS-20 subscales: difficulty identifying feelings, and difficulty describing feelings, as well as TAS-20 total score. This indicates that individuals who experienced their mothers as affectionate and warm through childhood are more likely to develop an awareness of internal feeling states and the ability to communicate their feelings to others. Conversely, individuals who experienced their mothers as emotionally cold, indifferent and neglectful appear to experience confusion about the physiology associated with emotion and find it difficult to put their feelings into words or describe their feelings to others. Maternal care did not predict the TAS-20 subscale externally oriented thinking and the maternal overprotection dimension did not show an association with any of the alexithymia subscales.

Neither of the paternal dimensions of parental bonding appeared to be significantly associated with alexithymia, although an unexpected positive association between paternal care and externally oriented thinking almost reached significance ($\beta = .23$, $p < .059$). Three analyses followed that confirmed this relationship.

Firstly, the CRQ and the PBI were entered into a regression analysis together to investigate the concurrent relationships of parental bonding and adult attachment with
alexithymia. With adult attachment dimensions entered into the model, the maternal care relationships with alexithymia were no longer apparent. In contrast, however, paternal care now showed significant positive associations with both the second and third alexithymia factors: difficulty describing feelings and externally oriented thinking. The adult attachment dimensions were differentially related to alexithymia factors. For example, anxiety in adult attachment relations was positively related to the first alexithymia factor, difficulty identifying feelings, while avoidance in adult attachment relations was positively related to the second and third alexithymia factors: difficulty describing feelings and externally oriented thinking. Unlike the paternal care relationships, these associations were in directions that made intuitive sense.

In the second analysis, anxiety and depression were added to the model to see whether the relationships between attachment and alexithymia persisted. There were minimal changes in the pattern of associations suggesting that, on the whole, depression and anxiety could not account for the attachment relationships with alexithymia. The only change in the pattern of relationships previously reported was that the CRQ anxiety relationship with the first TAS-20 factor was no longer significant, and was replaced, or subsumed by, a relationship between trait anxiety and difficulty identifying feelings. In this model, depression did not show a relationship with any of the alexithymia factors. All other CRQ and parental bonding relationships remained the same, including the positive relationships between paternal care and difficulty describing feelings, and externally oriented thinking.

While the CRQ relationships with alexithymia subscales were in anticipated directions, the new positive relationships revealed between paternal care and two of the TAS-20 subscales, difficulty describing feelings and externally oriented thinking, were unexpected. The size of these new relationships was small, but nonetheless significant. Positive relationships between paternal care and features of alexithymia are counterintuitive since high levels of care are a feature of optimal bonding, while alexithymia is hypothesized to result from problematic attachment relationships.

There is only one reference in the literature that links close and affectionate parenting of fathers with negative outcomes. This study also employs an eating disorder sample. In
their study of the relationship between parental bonding and Young's (1994) core beliefs in anorexic and bulimic women, Leung, Thomas, and Waller (2000) found that, maladaptive core beliefs in the anorexic group were associated with low levels of paternal care. In contrast, in the bulimic group, paternal care was unexpectedly positively correlated with 'vulnerability to harm' core beliefs. Also, in the bulimia group, core beliefs of 'social undesirability' were predicted by a combination of high paternal care and high maternal overprotection. The authors do not speculate about the origins of these relationships.

Interpreting the findings of Leung and colleagues (2000) and the present study with respect to negative outcomes relating to high paternal care presents a challenge. The PBI asks participants to rate parental characteristics. It does not measure or capture information relating to how the parental characteristics are construed by the participant or what effect they may have. One might speculate that, in addition to high maternal care, high paternal care could precipitate a sense of wariness outside the environs of a particularly close family unit, or that for some children, excessive warmth and affection provided by both parents cultivates dependency, such that the child is not encouraged to explore and seek challenges, and develops a sense of vulnerability in the company of other less well-known individuals.

In the present study, PBI paternal care relationships with TAS-20 subscales are exactly mirrored by those of the CRQ avoidance subscale. These features, together with vulnerability to harm core beliefs, can be viewed as a compatible cluster. For instance, vulnerability to harm beliefs appear to be well-matched with avoidance in interpersonal relationships and the alexithymic features of difficulty describing feelings and externally oriented thinking.

Possible alternative explanations for the result in the present study can be organized into four broad areas. Firstly, the finding may be erroneous, simply a function of the data and related to either the sample, or instruments used in the study. An explanation based on sample characteristics seems unlikely, however, because this particular analysis was based on the full data set from 113 participants, and, with respect to conceptual overlap of the instruments, scrutiny of the face validity of items in the measures used indicates that the
*paternal care* subscale questions are distinctly different from the TAS-20 subscale questions.

The second set of explanations would position the *paternal care* relationships with alexithymia as a byproduct of another undetected phenomenon, or more significant undetected relationship. For instance, the *paternal care* relationships with alexithymia subscales may be secondary to, and disguise, a relationship between low *maternal care* or high *maternal overprotection* and alexithymia. Given that *maternal care* and *paternal care* are positively correlated, and *maternal care* and *maternal overprotection* negatively correlated, this seems unlikely. Of course, it is quite possible that the primary phenomenon may not have been measured in the present study. In this case, *paternal care* might be thought of as a benign ‘marker’, for example, for maladaptive patterns of behaviour in the family, such as enmeshment, that have negative outcomes for emotion development.

Along the same lines, it is worth highlighting that the PBI measure includes statements about behavioural expression of emotion but does not include statements specifically relating to verbal expression of emotion. As a result it is possible for an individual to record high levels of care even though their early family environment was limited in verbal expression of emotions. Emotion language, and, specifically, the use of emotion words to label internal feeling states, facilitates the development of identification, symbolism, and expression of emotion, as well as emotion communication, psychological mindedness and interpersonal regulation of emotion (Thompson, 1994). It may be possible for parents to provide an environment that is high in care, low in overprotection, providing the conditions for optimal bonding, but deprived in emotion vocabulary. This may be identified by the PBI instrument only indirectly, through its relationships with measures of other constructs.

Partial support for an explanation that implicates family factors, such as low verbal emotion expression, or high enmeshment, is provided by the findings of one of the few studies investigating family factors associated with alexithymia, Kench and Irwin (2000). This study surveyed university students and found that the sole family variable independently predictive of global alexithymic tendencies was expressiveness. In terms of other variables that predicted individual components of alexithymia, this study found that
difficulty describing feelings was predicted by low levels of expressiveness, greater enmeshment, and a permissive family style. Externally oriented thinking was predicted by low intellectual-cultural orientation, and difficulty identifying feelings was predicted by a multiplicity of variables (Kench et al., 2000).

A third path of explanation is that the relationship between level of parental care and emotional development is not linear, or, that paternal care does not simply add incrementally to the positive influence of maternal care, as one might expect. For instance, instead of enhancing the likelihood of a positive emotion development outcome, it may be that a high level of care in both parents is counterproductive, perhaps because the child is less likely to be exposed to negative emotion conditions within the home environment. Alongside high maternal care, high paternal care may deny the child interpersonal challenges that extend experience and facilitate emotional development. Possibly, high levels of parental care reflect a sheltered environment that does not provide sufficient challenge for the child to develop full emotion potential.

Finally, a very simple explanation is that father's high level of care may reflect a parent's compensation for a temperamental, or other, vulnerability in the child.

The third analysis to identify a positive relationship between paternal care and alexithymia was a post-hoc multiple analysis of covariance that was performed to investigate whether the relationships between dimensions of parental bonding, adult attachment, and alexithymia varied between eating disorder subtypes. New disordered eating groups were formed for this analysis. Inclusion in the first group was based on high EDI-2 scores for the drive for thinness subscale combined with low-average BMI scores; this group represented individuals who indicated anorexia-like tendencies. Inclusion in the second group was based on high scores for the bulimia subscale of the EDI-2; representing individuals who reported bulimia-like symptoms. These groups were independently analysed with a comparison group which included individuals who were not included in either of the new disordered eating groups.

The results of this analysis clearly differentiated the groups. The pattern of relationships in the anorexia-like group were almost identical to findings of the previous
analysis using the full sample: trait anxiety was related to difficulty identifying feelings, paternal care was positively related to the two alexithymia factors, difficulty describing feelings and externally oriented thinking, and avoidance in adult attachment relations was also related to these alexithymia factors. For anorexia-like individuals, however, an additional dimension of parental bonding was significantly related to alexithymia: paternal overprotection was positively related to externally oriented thinking. In contrast to the anorexia-type group, none of the parental bonding dimensions was related to alexithymia in the bulimia-like group, but a new relationship was revealed between depression and the first alexithymia factor, difficulty identifying feelings.

The sample size in the new disordered eating subgroups was small and results have to be interpreted with caution, particularly when previously identified relationships lose significance. However, for new relationships to have been revealed, the effect size would need to have been reasonably large for significance to have been reached. Bearing this in mind, we can be fairly sure that statistically significant relationships reflect reasonable effect sizes. Hence, while trait anxiety is a major predictor of difficulty identifying feelings in the anorexia-like group, depression seems to be the major predictor of this component of alexithymia in the bulimia-like group. Similarly, a combination of paternal overprotection and paternal care appear to predict externally oriented thinking in the anorexia-like group but may not be related to these alexithymia dimensions in the bulimia-like group. In sum, while it is not possible to be conclusive, the results of this study suggest the possibility that precursors of alexithymia differ between eating disorder subtypes.

While the parental bonding relationships with alexithymia appear to be complex and, with respect to the paternal dimensions, are a challenge to interpret, the adult attachment relationships with alexithymia were fairly straightforward. The finding that the anxiety dimension of adult attachment style was related to difficulty identifying feelings shows some continuity with the literature. For instance, both trait and state anxiety have been linked with this facet of alexithymia (Berthoz et al., 1999; Marchesi et al., 2000). The relationships between the avoidance dimension of adult attachment and difficulty describing feelings makes conceptual sense. Alexithymic features that make it difficult for a person to put their emotions into words and share their thoughts and feelings with others are also likely to make intimacy in close relationships difficult to achieve. It is relatively
easy to see how externally oriented thinking, which has been linked to psychological mindedness might fit into this picture - the person who has low capacity for empathy, does not enjoy working out the meaning of events and has low interest in things psychological is much less likely to seek intimacy in interpersonal relationships.

The CRQ avoidance scale relationship with the third TAS-20 externally oriented thinking scale is an unusual finding from the point of view that, generally, very few studies report finding a relationship with this alexithymia factor. The relationship between both of the CRQ and all TAS-20 subscales confirms that insecure adult attachment style is related to elevations in alexithymia. Thus, the findings of the present study provide support for Tricholo (1998) who, using the Parent Attachment Questionnaire, reported a negative correlation between alexithymia and positive attachment style.

Influence of attachment on alexithymia

Together, the PBI and CRQ could explain almost half (48%) of the variance in TAS-20 total scores. With respect to TAS-20 subscales, these measures could explain approximately 42 per cent of the variance in difficulty identifying feelings, approximately 52 per cent of the variance in difficulty describing feelings, and approximately 17 per cent of the variance in externally oriented thinking. However, comparing parental bonding and adult attachment dimensions, the latter, as measured by the CRQ, was the better predictor of alexithymia overall, with both anxiety and avoidance subscales of the CRQ predicting TAS-20 total scores. Although the PBI and CRQ scales were moderately correlated, and both were related to alexithymia dimensions, it would appear from this analysis that, of the two constructs, adult attachment dimensions measured by the CRQ have a stronger relationship with alexithymia than parental bonding dimensions. This makes sense from a chronological perspective if one considers that the CRQ is a measure of adult attachment style, while the PBI is a measure of parenting experience in childhood. The relative strength of the predictive powers of the CRQ and PBI imply that attachment is a dynamic and evolving construct.
4.2 Alexithymia & Psychopathology

Psychopathology in the eating disorders group

A comparison of group data confirmed that the eating disorders and comparison groups were similar on most essential measures, such as age, but different on all measures that might indicate psychopathology.

A not unexpected finding was that there were statistically significant differences between the two groups on the EDI-2 subscales representing eating attitudes and behaviours and body image. The eating disorders group had significantly higher mean scores than the comparison group on the three subscales, drive for thinness, bulimia, and body dissatisfaction. High scores on these subscales have been shown to correlate with eating disorder symptomatology (Garner, 1991). This pattern of statistically significant higher mean scores for the eating disorders versus the comparison group was consistent and extended across all EDI-2 subscales, including the three provisional subscales. As an instrument, the original EDI, on which the EDI-2 is based, was empirically derived and refined based on its ability to differentiate between criterion groups of eating disorder patients and non-clinical samples. Thus, the pattern of elevated EDI-2 scores in the present study can be interpreted as evidence that disordered eating attitudes and behaviours and psychological themes associated with eating disorders were more pervasive in the eating disorders group than the comparison group.

Importantly, the pattern of differences in group mean scores found in the present study also provides some evidence of the validity of the three provisional scales of the EDI-2 in tapping psychological themes associated with eating disorders, in that mean scores on these subscales could differentiate the eating disorders and comparison groups.

In the present study, statistically significant group differences were also found for measures of anxiety and depression, with higher mean scores found for the eating disorders group on instruments measuring these constructs. With respect to depression, the mean BDI-II score for the eating disorders group was in the 'severely depressed' range, while the mean score for the comparison group was in the 'minimal depression' range. Similarly, anxiety scores were significantly higher for the eating disorders group, with this
group reporting being more anxious on the day of testing (state anxiety), as well as generally more anxious (trait anxiety), than members of the comparison group. The mean STAI state and STAI trait anxiety scores for the comparison group were comparable with normative data for the general population, while the mean anxiety scores for the eating disorders group were considerably higher than published mean scores for women of this age group, general medical and surgical patients, and neuropsychiatric patients suffering either depression or anxiety reactions (Spielberger, 1983). This finding of severe levels of anxiety and depression in the eating disorders group was predicted, based on the reported high level of comorbidity of anxiety and depressive disorders in eating disorder populations (American Psychiatric Association, 1994), and confirmed by empirical research in this area (e.g. Corcos et al., 2000; De Groot et al., 1995; Schmidt et al, 1993; Sexton et al., 1998).

**Higher prevalence of alexithymia in the eating disorders group**

Using the empirically derived TAS-20 cut-off score of \( \geq 61 \) recommended by Taylor and colleagues (Taylor, 1996), the rate of alexithymia of 53 per cent \( (n = 16) \) found in the eating disorders group was much higher than the rate of 13 per cent \( (n = 11) \) found in the comparison group. This finding is consistent with reports of a high prevalence of alexithymia in patients with eating disorders (De Groot et al., 1995; Taylor, 1996). The rate of alexithymia found in the eating disorders group in the present study is lower than the rate of 77 per cent reported by Bourke and colleagues (1992) for anorexia nervosa patients completing the TAS, but comparable with more recently published rates which range from 48 to 63 per cent for samples of patients with anorexia nervosa and from 40 to 63 per cent in patients with bulimia nervosa (Cochrane et al., 1993; De Groot et al., 1995; Jimerson et al., 1994; Schmidt et al., 1993). All of these studies, however, used the original TAS. Using the revised TAS-20 and a lower cut-off score of 55, Corcos and colleagues found that 56 per cent of the anorexic group, 49 per cent of the bulimia group, and 12 per cent of the control group were alexithymic (Corcos et al., 2000). Taylor and colleagues, using a cut-off of \( \geq 61 \) on the TAS-20, found that 69 per cent of an anorexic group and 11 per cent of an unmatched comparison group were alexithymic (Taylor, 1996). The rates found in the present study are comparable with the findings of these studies.
With respect to absolute levels of alexithymia, the mean TAS-20 total score for the eating disorders group was significantly higher than that of the comparison group. This finding confirms the prediction that the eating disorders group would be more alexithymic than the comparison group, and is in agreement with consistent reports in the literature of elevations in alexithymia in eating disorder populations (Cochrane et al., 1993; De Groot et al., 1995; Jimerson et al., 1994; Schmidt et al., 1993; Taylor, 1996). The mean TAS-20 total score for the eating disorders group was 59.77, which is just below the TAS-20 cutoff score of > 60 that has been identified as distinguishing alexithymic from normal range scores (Taylor, 1996).

Most of the published research of alexithymia in eating disorder samples has tended to use the original TAS which has more items and a higher cut-off score than the TAS-20, hence comparison with the mean scores found in the present study is not relevant. However, the mean scores of the groups in the present study appear to correspond with means reported in more recent literature for studies that used the TAS-20. For example, the mean score of 59.77 found for the eating disorders group is lower than the mean TAS-20 total score of 64 reported for an anorexic sample (Taylor, 1996), and higher than the mean TAS-20 total scores of 56 for an anorexic sample and 49.5 for a bulimic sample reported by Corcos and colleagues (Corcos et al., 2000). Also, the mean TAS-20 total score of 44.28 found for the comparison group in the present study is comparable with published control group mean scores of 40 (Rastam et al., 1997), and 43 (Taylor, 1996). Unfortunately, Corcos and colleagues report group means for anorexia and bulimia groups but not for their control group.

In the present study, significant group differences were observable in two of the three TAS-20 subscales: difficulty identifying feelings, and difficulty describing feelings, with higher mean scores in the eating disorders group than comparison group. However, no group differences were found with respect to mean scores of the third subscale, externally oriented thinking. These findings are similar to those of Troop and colleagues who, using the earlier version of the TAS, found that three eating disorder groups (AN-R, AN-B, BN) scored higher than a control group on the 'inability to identify feelings' and the 'paucity of fantasy' subscales, but scores on the 'externally oriented thinking' subscale did not distinguish the eating disorder groups from the control group (Troop et al., 1995).
Similarly, using the TAS, De Groot and colleagues found that bulimic women scored higher than a control group on the first two factors that assess capacities to identify feelings but not on ‘externally oriented thinking’ (De Groot et al., 1995). The findings of the current study also match the pattern of group differences in TAS-20 subscale scores for an anorexic group compared with control group reported by Taylor and colleagues, who found significant group differences for mean scores on difficulty identifying feelings, difficulty describing feelings, and TAS-20 total but no difference between the groups’ mean scores for the externally oriented thinking subscale (Taylor, 1996).

This pattern of mean subscale score differences does not appear to be restricted to eating disorders versus normal control samples suggesting that the elevations found in some subscales relative to others may not be a feature specific to eating disorders. Rather, the patterns found may generalise to all psychopathology. For instance, Marchesi and Maggini (2000) reported a similar pattern of differences in a depressed patient group and anxious patient group compared with age-matched general medical patient control subjects. In their study, the TAS-20 total mean score was higher in depressed and anxious patients than control patients and that mainly depended on the feeling aspects of the alexithymia scale, difficulty identifying feelings, and (in depressed patients only) difficulty describing feelings. Once again, no significant group differences were identified with respect to the third subscale, externally oriented thinking.

4.3 The Relationships between Alexithymia, Depression, and Anxiety

It has been suggested that the increased prevalence of alexithymia found in eating disorder samples cannot be interpreted without taking depression into account (Corcos et al., 2000). A number of authors report that high rates of alexithymia in eating disorder samples may be related to the presence of depression (De Groot et al., 1995; Sexton et al., 1998). Additionally, trait and state anxiety have been associated with alexithymia (Berthoz et al., 1999; Haviland et al., 1994; Marchesi et al., 2000). However, findings in this area are inconsistent and relationships between these variables are not clear.
The present study found a relationship between depression and alexithymia in the full sample. Depression and anxiety could account for eating disorder and comparison group differences in alexithymia, and, when the groups were collapsed and redefined on the basis of EDI-2 subscale scores, the results of repeat analysis mirrored the findings of analysis using the original grouping.

Depression appeared to have a strong relationship with alexithymia. For instance, BDI-II scores were significantly and positively correlated with the TAS-20 total scores and all three alexithymia subscales. The largest correlation found was with difficulty identifying feelings, followed by difficulty describing feelings, and the lowest correlation was with externally oriented thinking. The BDI-II scores were also positively correlated with both STAI state and STAI trait anxiety scores, and the STAI state and trait scores were positively correlated with each other, indicating that depression and anxiety constructs were related in this sample.

Using the TAS, rather than the TAS-20 used in the present study, alexithymia, depression and anxiety dimensions have been found to correlate in female college students (Berthoz et al., 1999), and medical students (Haviland et al., 1991), as well as women and men hospitalized for psychoactive substance dependence (Haviland et al., 1994). Additionally, Corcos (2000) found that alexithymia and depression were correlated in an eating disorders sample. The findings of the present study are also consistent with the findings of Jimerson and colleagues (1994), who investigated TAS factor scores in individuals with bulimia nervosa. Jimerson and colleagues (1994) found high correlations between TAS and STAI trait anxiety in particular, and between the TAS and BDI. The BDI and STAI were also found to be highly correlated. Only one study, reported by Schmidt and colleagues (Schmidt et al., 1993), did not find a correlation between alexithymia and depression. This study included an eating disorder sample, and, like other studies, used the original version of the TAS but used a different measure for depression, which might account for the divergent findings. Contrary to Schmidt and colleagues, but in agreement with the majority of studies, the findings of the present study provide support for a relationship between alexithymia, anxiety and depression constructs.
Elevated levels of alexithymia in the eating disorders group compared with the comparison group could be accounted for by the presence of higher levels of depression and anxiety in the eating disorders group. In fact depression and anxiety accounted for more than half of the variance in TAS-20 total scores. The strength of relationship between depression, anxiety and the alexithymia factors varied. The greatest amount of variance explained was for the difficulty identifying feelings subscale (61%), followed by the difficulty describing feelings subscale (43%), and the least variance explained for the externally oriented thinking subscale (7%). In sum, it appears that depression and anxiety are reasonably strongly related to the alexithymia factors that relate to ‘feelings’. In particular, depression and anxiety show a strong relationship with the first alexithymia factor, difficulty identifying feelings. This is not unexpected, since all three constructs include somatic elements that can be readily related to impaired interoceptive awareness.

Several previous studies have found that depression can account for elevated alexithymia scores, although only one study found that depression could account for all of the alexithymia elevation. That study, reported by Corcos and colleagues (2000) found that elevated levels of alexithymia in an anorexia group compared with a bulimic group could be accounted for by controlling for the higher levels of depression in the former group. In contrast, a number of studies have found that depression can account for some but not all of the elevations in alexithymia. A number of these studies found that the TAS factor related to ‘identifying feelings’ is most highly related to depression (Kirmayer et al., 1993; Parker et al., 1991; Sexton et al., 1998) although others have found that elevations in this factor remain after controlling for depression (De Groot et al., 1995; Jimerson et al., 1994). One study found that elevations in the TAS factor related to ‘describing feelings to others’ remained higher after controlling for depression (Sexton et al., 1998). All of the above studies used the original four-factor TAS, whereas the present study used the better validated three-factor TAS-20.

In the present study, a strong association was revealed between STAI trait anxiety ratings and the TAS-20 total and subscale scores. Specifically, relationships were identified between trait anxiety and difficulty identifying feelings scores, trait anxiety and difficulty describing feelings scores, as well as trait anxiety and the TAS-20 total scores. No relationships were revealed for STAI state anxiety. An association was also found
between the BDI-II and difficulty identifying feelings scores. Although the BDI-II had shown a correlation with externally oriented thinking, after entering depression and anxiety into multivariate analysis of variance, neither BDI-II ratings nor the STAI trait and STAI state ratings showed a significant association with scores on the externally oriented thinking subscale of the TAS-20. Thus, when depression was analysed with anxiety entered into the model, the significance of the relationships between depression and alexithymia was much reduced and anxiety, in particular trait anxiety, showed a stronger relationship with alexithymia factors. Of particular interest, both depression and anxiety appear to be related to the difficulty identifying feelings factor in the full sample, while neither showed a persistent relationship with the third factor, externally oriented thinking. This is consistent with the several findings reported in the literature (De Groot et al., 1995; Berthoz et al., 1999; Haviland et al., 1994). Marchesi and colleagues found that, although both depression and anxiety were higher in anxious and depressed patients, only anxiety was related to difficulty identifying feelings in multiple regression analysis (Marchesi et al., 2000).

Several factors in the present study suggest that the differences in alexithymia scores found between the eating disorders and comparison groups could be strongly related to the presence of anxiety and depression. Firstly, in the full sample, a large and significant positive correlation was found between BDI-II ratings and scores on all three TAS-20 subscales as well as TAS-20 total scores. Secondly, analysis of the eating disorders group scores on the BDI-II and STAI showed that they were significantly more depressed and more anxious than the comparison group. Thirdly, when ratings for the depression and anxiety measures were controlled for, the group differences in the TAS-20 total and TAS-20 subscale scores were no longer significant. Finally, results of multivariate analysis of variance demonstrated that a high proportion of the variance in TAS-20 scores could be explained by trait anxiety in particular, and also by depression.

4.4 Education Level and Age as Possible Confounding Variables

In some studies, alexithymia has been found to covary with education level, with lower rates of alexithymia found amongst more highly educated groups (De Zwaan et al.,
1995; Honkalampi et al., 1999; Taylor, 2000). Given there were significant differences in education level between the eating disorders and comparison groups in the present study, with higher education levels in the comparison group, it was important to investigate education level as a possible confound. Analysis of variance showed no interaction between education and group, however, lower education level was associated with elevations in two of the TAS-20 subscales, difficulty describing feelings (DDF) and externally oriented thinking (EOT), as well as TAS-20 total scores, indicating that alexithymia, and, perhaps, the alexithymia dimensions corresponding with two of the TAS-20 subscales in particular, covaried with education level. This finding is consistent with, and provides further evidence for the independent findings reported by Kirmayer and Robbins (1993) and Honkalampi (1999), that higher total alexithymia scores are associated with lower education.

As a categorical variable, education was not included in analyses using continuous data. Without controlling for group differences in education level, education could not be eliminated as a possible confounding variable. It is possible, therefore, that the higher scores and rates of alexithymia found in the eating disorders group may be the result of lower education in this group.

A weak association between alexithymia scores and age is also reported in the literature, although findings are mixed, with some studies reporting that alexithymia scores show a tendency to decrease with age (Kench et al., 2000; Morrison et al., 1989), some reporting that alexithymia increases with age (Pasini et al., 1992; Posse et al., 1999), while others have reported finding no association. In a sample of college students Bagby and colleagues found a low magnitude correlation between TAS-20 scores and age (Bagby, Parker et al., 1994). Only one study investigated alexithymia in an eating disorder sample and reported finding no relationship between these variables (Cochrane et al., 1993). In the present study, a t-test for age revealed no significant difference between group means. Age was included as a covariate in further analysis as a precautionary measure, but no effect for age was identified. The results of this study, therefore support the findings of Cochrane and colleagues (Cochrane et al., 1993).
4.5 Alexithymia and Attachment: Relationship with Eating Disorders

There has been little study of the relationships between alexithymia and attachment and disordered eating attitudes and behaviours. The present study used regression analysis of data from the full sample to perform an exploratory investigation to identify relationships between the TAS-20 measure of alexithymia, as well as parental bonding and adult attachment measures, and the EDI-2 which assesses psychological themes associated with eating disorders. Given that anxiety and depression have been identified as confounding variables, measures of these constructs were also included in analysis to control for their effects.

In summary, only the three TAS-20 subscales, together with the BDI-II, showed a main effect with the EDI-2, indicating that, of the constructs measured, alexithymia and depression are the strongest predictors of the set of psychological themes associated with eating disorders. The alexithymia, parental bonding and attachment measures were the variables of interest in this analysis and will be the focus of the discussion. However, it should be mentioned that, of all constructs in the analysis, depression had the most extensive relationships with characteristics associated with eating disorders. The BDI-II predicted eight of the eleven EDI-2 subscales. The four strongest relationships were with drive for thinness, ineffectiveness, asceticism, and maturity fears. The BDI-II relationships with body dissatisfaction, interoceptive awareness, impulse regulation, and social insecurity, were moderate in strength and positive. STAI trait anxiety was related to ineffectiveness and social insecurity.

Three of the EDI-2 subscales bear close relationships to eating disorder pathology: drive for thinness, bulimia, body dissatisfaction. Depression and an attachment style that is characterized by anxiety in close relationships were identified as being able to predict drive for thinness. The alexithymia factor difficulty identifying feelings was the only predictor variable to show a significant positive relationship with bulimia. This result bears resemblance to the finding that alexithymia correlates positively with self-reported bulimia symptomatology in college women (Tricholo, 1998). Some of the symptoms of bulimia nervosa, including binging, vomiting, starvation and hyperactivity, have been conceptualized as attempts to regulate distressing undifferentiated emotional states.
(Goodsitt, 1983; Taylor, 1997). Thus, it is possible that some of the features of alexithymia have a causal role in bulimia nervosa symptoms. The alexithymia scales did not show relationships with *drive for thinness* or *body dissatisfaction* which is consistent with the report of Taylor and colleagues (1996).

In their study of anorexic women, Taylor (1996) found that TAS-20 *total* scores were not related to eating disorder attitudes such as *drive for thinness* and *body dissatisfaction* but showed a positive association with psychological characteristics relating mainly to difficulties in self-and affect-regulation such as *ineffectiveness*, *interpersonal distrust* and lack of *interoceptive awareness*, as well as *maturity fears*. In their study of female college students, Laquatra and Clopton (1994) found that the original TAS was positively and significantly correlated with seven of the eight EDI subscales (the EDI was published prior to the development of the three provisional subscales). No relationship was found between the TAS and *perfectionism*. Providing further support for Taylor and colleagues' (1996) findings, Laquatra and Clopton report that the strongest relationships were found with *interoceptive awareness*, *ineffectiveness* and *interpersonal distrust*. Relationships between the TAS measure and *ineffectiveness* and *interpersonal distrust* are also reported by De Zwaan and colleagues (1995), who investigated a sample of obese women almost half of whom had binge eating disorder.

As none of the above studies report alexithymia subscale relationships, this study extends earlier research by investigating the TAS-20 factor relationships with psychological themes associated with eating disorders. The findings of the present study differ from earlier studies in that relationships between alexithymia and *ineffectiveness*, or *maturity fears* were not supported, additionally, a negative relationship was found between the *externally oriented thinking* alexithymia factor and the EDI-2 subscale *perfectionism*. This latter finding suggests that an externally oriented cognitive style is associated with a tendency to be less perfectionistic, while an internally focused cognitive awareness or ‘psychological mindedness’ is associated with increased perfectionism.

In confirmation of the findings of all three earlier studies, a relationship was found between two of the alexithymia factors relating to feelings (*difficulty identifying feelings* and *difficulty describing feelings*), and the EDI-2 subscale *interpersonal distrust*. However,
while difficulty describing feelings showed a positive association, the relationship between difficulty identifying feelings and interpersonal distrust was unexpectedly negative. This finding suggests that the relationship between alexithymia and this feature of eating disorder symptomatology may be more complicated than had previously been thought, and, therefore, deserves further exploration. The positive association between difficulty describing feelings and interpersonal distrust makes sense since there is conceptual overlap between a reluctance to form close relationships and sense of alienation and self-disclosure of innermost feelings. A negative relationship between difficulty identifying feelings and interpersonal distrust suggests that the individual with an impaired ability to differentiate internal states is more inclined to seek out the company of others, and, perhaps, depends on others to help them interpret and deal with their internal confusion.

Two relationships were also revealed with two of the new unvalidated EDI-2 subscales. Firstly, the difficulty describing feelings factor predicted social insecurity, which is related to beliefs that social relationships are disappointing, insecure, tense and unrewarding. Secondly, the difficulty identifying feelings factor predicted problems with impulse regulation, which is related to tendencies of impulsivity, recklessness, and self-destructiveness, and substance abuse. This last relationship bears resemblance to the relationship identified earlier between difficulty identifying feelings and bulimia symptoms, and similarly, the behaviours associated with impulse regulation may reflect attempts at regulating confusing, undifferentiated emotional states (Goodsitt, 1983; Taylor, 1997) that result from this particular alexithymic feature.

Parental bonding dimensions were associated with eating disorder themes of body dissatisfaction, maturity fears, and impulse regulation. PBI maternal overprotection showed a positive relationship with maturity fears, suggesting that the effect of an over-controlling and intrusive parenting style in the mother precipitates a fear of the independence and autonomy associated with adulthood, and creates a desire to retreat to the security of childhood. In contrast, PBI paternal overprotection showed a negative relationship with impulse regulation, suggesting that similar behaviours in mother and father may be experienced or perceived differently thereby resulting in different outcomes. It seems that paternal overprotection results in a reduced tendency to be impulsive, reckless, and self-abusing.
Both maternal and paternal PBI scales were related to body dissatisfaction. Paternal overprotection showed a positive relationship with this EDI-2 subscale, suggesting that controlling behaviours associated with preventing independence in the father increase the daughter's dissatisfaction with her own body weight and shape. Of interest, the relationships between the PBI maternal subscales and body dissatisfaction appeared to be contradictory. In contrast with paternal overprotection, maternal overprotection showed a statistically significant negative relationship with body dissatisfaction indicating that while reports of father as more controlling and intrusive are associated with increased body dissatisfaction, reports of the mother as encouraging autonomy and independence are associated with less dissatisfaction with body weight and shape.

With respect to the CRQ, three relationships with EDI-2 subscales were revealed. It seems that an attachment style characterized by increased anxiety in close relationships was associated with body dissatisfaction, indicating that relationship insecurity leads the individual to focus on and become increasingly critical of their physical attributes, or vice versa. While the CRQ anxiety subscale relationships were confined to body dissatisfaction, the CRQ avoidance subscale was positively related to interpersonal distrust and to social insecurity. These associations make intuitive sense since avoidance and desire for detachment in close relationships (CRQ avoidance) is similar, conceptually, to feelings of alienation and reluctance to form close relationships (EDI-2 interpersonal distrust) and beliefs that social relationships are insecure and unrewarding (EDI-2 social insecurity).

4.6 Limitations of This Study

Perhaps the greatest limitation of this study relates to the sample size. The number of participants was relatively small in total (N = 113), and, in particular, this was the case for the eating disorders group (N = 30), which limits the generalisability of results. Another major issue relates to heterogeneity of the sample. For instance, the eating disorders group included participants with various diagnoses and different degrees of symptomatology, and, because the comparison group was not screened for eating disorders or psychopathology, the results of analyses that relied on group comparison may have been
compromised. Additionally, the exclusive use of females means that results cannot be extended to the general population. It should be noted that, although eating disorders are believed to occur in males only rarely, their existence has been documented and is recognised in the DSM-IV (American Psychiatric Association, 1994).

The possibility that this study suffered from selection bias cannot be discounted, particularly as a number of individuals who were registered with Eating Disorders Service at The Princess Margaret Hospital declined to participate. These individuals may have been characteristically different from individuals who agreed to participate.

With respect to statistical analysis, inequity in size of groups is likely to have reduced power of analyses and increased the effect size required for statistical significance. The same issue applies to post hoc analyses due to the small number of participants included in the redefined disordered eating groups. Also relating to statistical analysis, a weakness of this study is that, in several analyses, a large number of predictor variables were entered. This increases the chance of Type I error with respect to relationships revealed. Regarding this study, in those instances where a large number of variables were included in analysis, the statistical analyses used were thought to be sufficiently sophisticated that it was considered unnecessary to perform post-hoc significance testing.

As highlighted earlier, the possibility that education is a confounding variable cannot be excluded since significant group differences in education level that had been identified with chi square analysis were not accounted for in later analysis. This is a concern since education has been identified as a confounding variable in previous research and was found to covary with alexithymia in the present sample. However, a relative strength of the present study is that analyses included anxiety, depression, and age as covariates. These variables have also been found to covary with alexithymia. The majority of investigations in this area fail to take account of the confounding effect of these variables.

The findings of this study must be also be interpreted within the constraints imposed by use of self-report instruments. Participant responding may have been affected by response biases, with participants choosing to alter the information they disclosed in order to fulfil the expectations of social desirability, or limiting the information they disclosed.
due to its personal nature. This is particularly relevant to the present study which required participants to reveal sensitive information relating to mood states, eating behaviours, body weight and shape issues, as well as thoughts and feelings regarding close interpersonal relationships and their experience of their parents.

Compared with semi-structured interview, self-report measures have the advantage of standard administration and scoring, and are economic when sampling large numbers. With the exception of the Close Relationships Scale (CRQ), the self-report measures used in the study were selected on the basis of proven reliability and validity. The CRQ was developed for the purposes of this research and is an unvalidated scale. As an instrument, the results of this study suggest the CRQ shows promise. Designed as a measure of adult attachment dimensions, the two subscales are moderately correlated and therefore have a degree of internal consistency. The CRQ appears to be related to the PBI, an instrument that assesses a related construct, and it shows diverse relationships with the TAS-20 subscales. The CRQ seems to be measuring a different construct from the STAI, a validated measure of state and trait anxiety, and yet shows some similar associations, which is desirable since one of the dimensions it aims to assess is anxiety in close relationships. However, until subjected to factor analysis, item response analysis, and reliability checks including test-retest reliability, the validity and reliability of the CRQ are open to criticism.

Finally, the use of BDI-II and STAI self-report measures to assess mood and anxiety in alexithymic individuals does not appear to have been raised as an issue. The question is put: how does alexithymia, and the corresponding lack of insight into feeling states, affect reporting on these clinical measures? Alexithymia may compromise self-report of anxiety and depression feeling-related symptoms, leading clinicians to underestimate the severity of the disorder.
4.7 Future Directions

At the very least this study requires replication with a larger sample size, to overcome problems encountered with power in analysis. The heterogeneity of eating disorder subtypes and questionable independence of groups could be addressed by ensuring diagnoses are current and screening the comparison group for psychopathology. Employing longitudinal research design, using additional methods of collecting information (for instance, supplementing self-report with structured interview or collaborative information from others), and extending the study by including alternative measures to further validate findings would all be relevant investigative options for future research.

The present study found an association between parental bonding, adult attachment dimensions and alexithymia and, therefore, provides some support for the hypothesis that implicates problematic attachment relations in the development of alexithymia. Surprisingly, this area has been little studied to date. Further exploration of the extrinsic (family and environment characteristics) and intrinsic (psychological characteristics) factors associated with interrupted emotion development, conceptualised as a precursor to alexithymia, promises to be fruitful.

An area of research interest that is critical to further developing theory and understanding of alexithymia relates to the state versus trait distinction. Alexithymia has been conceptualized as both a clinical state (sometimes referred to as secondary alexithymia) and as a more stable aspect of personality functioning (Horton et al., 1992; Parker et al., 1991; Sifneos, 1975). The components of alexithymia have been shown to have different correlations with state phenomena such as level of depression (Kirmayer et al., 1993; Parker et al., 1991), and state anxiety (Haviland et al., 1994; Marchesi et al., 2000), as well as trait anxiety. It seems that alexithymia and depression and anxiety are overlapping but separate constructs, however, the complexity of the state versus trait attributes of the constructs may eventually limit full understanding of the inter-relationships. For instance, so far, two competing models have been presented to explain the relationships between alexithymia, anxiety and depression. Firstly, Haviland and colleagues hypothesize a model in which state anxiety predicts depression and all
components of alexithymia, while depression predicts only the difficulty identifying feelings factor of alexithymia (Haviland et al., 1994). Berthoz and colleagues, on the other hand, hypothesize a model whereby depression predicts both state and trait anxiety and these in turn predict alexithymia (Berthoz et al., 1999). Quite legitimately, each has interpreted the results of their study and demonstrated support for their respective model.

An alternative view gives consideration to the current conceptualization of the state and trait aspects of the respective constructs and also takes into account the intrinsic qualities of the instruments designed to measure these constructs. For instance, the phrasing of the instructions for the instruments establishes a context for responding, as does the content of the items. This must be taken into account in constructing a model using data from the instruments. If an instrument generates state-like data then the latter should be analysed and interpreted in accordance with the features of state phenomena. The same logic should be applied for trait-like data. For example, the BDI-II asks individuals to base their responses on how they have “been feeling during the past two weeks, including today”, the state form of the STAI asks about feelings “right now, that is, at this moment”, and the trait form asks the individual to indicate how they “generally feel”. The TAS-20 asks individuals to indicate how much they agree or disagree with statements that are worded generally, for instance, “I am often confused about what emotion I am feeling”, and “Being in touch with emotions is essential”.

Based on the conceptual positioning of these constructs, it would seem appropriate to test a different model. In an alternative model, trait components of alexithymia and trait anxiety might be viewed as interacting to predict state anxiety, depression and state components of alexithymia (see Figure 8). The literature to date suggests that there might also be a relationship between state anxiety and depression and between depression and state alexithymia.
Figure 8. Hypothesised Relationships between Alexithymia, Anxiety, and Depression.

The proposed new model is consistent with relationships between the constructs that have been reported in the literature. Unfortunately, there is no instrument separating trait and state features of alexithymia available at this point in time. Such a measure would need to be developed prior to testing the new model. Investigation of the state versus trait aspects of alexithymia would appear to be a fruitful area to focus on for future research.

Finally, the precise role of alexithymia in eating disorders is not, as yet, fully understood. Alexithymia may be an enduring trait that creates a vulnerability to psychopathology such as eating disorders, or it may be a state reaction to physical and psychological illness (Wise, Mann, Mitchell, Hryvniak & Hill, 1990; Haviland et al., 1988). Alexithymia does not appear to improve in the short term with weight gain in anorexia patients (Pierloot et al., 1988) or with alleviation of binge-purge symptoms in bulimia patients (Schmidt, Jiwany et al., 1993). This suggests that alexithymia is not secondary to eating disorder behaviour or symptoms per se. There is still much to be learned about the role and implications of alexithymia in eating disorders and psychopathology in general.

In sum, although there are a number of limitations, the findings of this study are considered interesting and potentially useful for future research.
REFERENCES


APPENDICES
Appendix 1.

Dear participant,

Enclosed in this envelope are the following:

1. **Information Sheet:** This describes the research project. Please read the Information Sheet before completing the Consent Form or any of the Questionnaires. The Information Sheet is for your interest and is yours to keep.

2. **Consent Form:** If you choose to participate in the project, then please complete the Consent Form and indicate whether you would like to be included in the prize draw. The Canterbury Human Ethics Committee requires that informed consent is obtained for all research conducted by the University of Canterbury.

3. **Questionnaires:** There are six questionnaires enclosed in this envelope. If you choose to participate in the project, then please complete all of the questions in all six questionnaires. It will take approximately an hour to complete all the questionnaires. Please try to complete all the questionnaires in one sitting, with a small break if necessary. It is quite important that they are completed within, say, the same afternoon or evening. You may find that a few of the questions are similar, please continue to answer all of the questions. It is important that you answer the questions honestly. Please note that the information you provide will be treated confidentially and will only be accessible to the researcher, Susan Selway, and her supervisor, Professor Ken Strongman. The data will be used to develop a ‘group average’, and individual information will not be identifiable.

If you have any questions, or would like to discuss your participation in the project please contact Susan Selway. Her contact details are provided on the Information Sheet.

*Please remember to provide your telephone number, postal address and/or email address for the prize draw!*

Thank you for participating in this research project.
Appendix 2.

University of Canterbury
Department of Psychology

Information Sheet

Research Project Title: General levels of emotional awareness and responsiveness, experience in childhood and adult relationships, and eating attitudes and behaviours.

You are invited to participate in a research project which is concerned with people’s general levels of emotional awareness and responsiveness, experience in childhood and adult relationships, and eating attitudes and behaviours.

Your participation in this project would involve answering six questionnaires. This would take about one hour to complete. Your signature on the attached consent form will be taken as your informed consent to participate in this study.

In appreciation of time given to completing the enclosed questionnaires, participation in this study enables optional entry into a prize draw for two prizes of $150 each. The names of two participants will be drawn when 100 participants have returned completed questionnaires or at the end of November, whichever comes first. Participant’s email addresses and/or alternative contact details will be collected for the prize draw when the completed questionnaires are returned.

Confidentiality

There will be complete confidentiality of all data gathered in this project. The identity of participants will not be made public. Please note that the questionnaires are numbered to protect the identity of participants. Names of participants who wish to enter the prize draw will be listed separately. To ensure anonymity and confidentiality, your personal details will be destroyed once the prize draw has taken place. In the meantime, the information will remain in locked cabinets and will be inaccessible to anyone other than the authorised researchers (Ms Susan Selway and Professor Ken Strongman).

If you have any questions or concerns about your participation in this project, please contact Susan Selway by telephoning (03) 981 3333, or email:

sls40@student.canterbury.ac.nz

The University of Canterbury Human Ethics Committee has reviewed and approved this project.

Please read and complete the attached Consent Form.

Thank you for your participation in, and contribution to, this project.
University of Canterbury
Department of Psychology

Researcher: Susan Selway
Contact Address: Department of Psychology
University of Canterbury
P O Box
Christchurch
Email Address: sls40@student.canterbury.ac.nz
Date: 19 October 2001

Consent Form

Research Project Title: General levels of emotional awareness and responsiveness, experience in childhood and adult relationships, and eating attitudes and behaviours.

I have read and understood the description of the above-named project. On this basis I agree to participate as a subject in the project, and I consent to publication of the results of the project with the understanding that anonymity will be preserved.

I understand also that I may at any time withdraw from the project, including withdrawal of any information I have provided.

NAME (please print): .................................................................

Signature: ........................................................................

Date: ........................................................................

Please enter my name in the prize draw for one of two prizes of $150 each: Yes / No
If I win, please contact me by telephone on this number: .........................
Or by post/email at this address: ..............................................................
Appendix 4.

Dear Patient,

We would like to invite you to take part in a research project that we are conducting at The Eating Disorders Service. In particular, we are interested in examining in more detail typical thoughts and feelings and relationships that people with eating disorders have about themselves and the world in general. Accompanying this letter is an information sheet that outlines more detail about this.

If you decide to take part we will arrange for you to fill in a number of questionnaires. This will take up to an hour or an hour and a half and can be conducted over one or two sessions. If you have been given this letter at an initial assessment appointment we will arrange a further appointment time for you to do this but there will be fewer questionnaires as some of them you will already be filling out today as a routine part of your assessment. Please fill in the slip below and our research assistant (Susan Selway) will be in touch with you to arrange an appointment. If transport is difficult, we can help with this.

In return for your participation we will offer you a profile of your core belief systems and some interpretation of the implication of these for you. These core belief systems are also known as “life traps” in that they can cause psychological difficulties if not acknowledged and addressed.

This information will be available to your therapist if you would like to discuss it, your results will otherwise be kept confidential. No material that could possibly identify you will be used in any reports of this study. In fact, results will be added together and reported as a group result.

If you would like to make yourself available to participate in this study please cut off and return the slip at the bottom of the page in the enclosed addressed envelope. If you do not want to participate please return it also as Susan may follow this letter with a phone call if we do not hear from you. If you indicate that you do not want to participate we will not phone you.

Please do not hesitate to contact us at the above number if you have any further questions.

Yours sincerely

Averil Overton (Psychologist) Dr Anne Young (Psychiatrist)

I ........................................ (name) would / would not like to participate in the study about thoughts, feelings, relationships and eating disorders and in return receive an individualised profile of these.

Signed........................................ date..............................
CONSENT FORM

SCHEMAS, EATING DISORDERS, EMOTIONS AND ATTACHMENT STUDY

Principal Investigator: Averil Overton, Clinical Psychologist. Associated investigators: Dr Anne Young, Consultant Psychiatrist, and Susan Selway, Research Assistant and Clinical Psychology student; These three people can be contacted at The Eating Disorders Service, The Princess Margaret Hospital. Phone 337 7707 (337 7899).

I have read and I understand the information sheet dated 23/10/01 for participants taking part in this study which is designed to examine how eating disorders are related to or affect ways of thinking and feeling and may be connected to early relationships with others. I have had the opportunity to discuss this study and feel satisfied with the answers I have been given.

I understand that taking part in this study is voluntary (my choice) and that I may withdraw from the study at any time and this will in no way affect my current or future health care. I understand that my participation in this study is confidential and that no material that could identify me will be used in any reports on this study.

I have had time to consider whether to take part. I know that I can discuss any questions I have about it with a clinician at any time during the study should I feel the need to. I also know whom to contact if I have any questions about the study.

- I agree to the scores of my questionnaires being available to my treating clinician

   YES/NO

- I wish to receive a copy of the results

   YES/NO

- I________________________ hereby consent to take part in this study.

- Signature:________________________ Date:________________________

Consent Collected by

- Name _______________________________
Appendix 6.

TAS-20 – I

Developed by Graeme J. Taylor, David Ryan, and Michael Bagby

Instructions:

Please indicate the extent to which you agree or disagree with each statement by writing the corresponding number in the space provided:

1 = Strongly disagree
2 = Moderately disagree
3 = Neither disagree nor agree
4 = Moderately agree
5 = Strongly agree

For example, if you moderately agree with statement number five write the number 4 in the space immediately to the left of that statement.

1. ____ I am often confused about what emotion I am feeling.
2. ____ It is difficult for me to find the right words for my feelings.
3. ____ I have physical sensations that even doctors don’t understand.
4. ____ I am able to describe my feelings easily.
5. ____ I prefer to analyse problems rather than just describe them.
6. ____ When I am upset, I don’t know if I am sad, frightened, or angry.
7. ____ I am often puzzled by sensations in my body.
8. ____ I prefer to just let things happen rather than to understand why they turned out that way.
9. ____ I have feelings that I can’t quite identify.
10. ____ Being in touch with emotions is essential.
11. ____ I find it hard to describe how I feel about people.
12. ____ People tell me to describe my feelings more.
13. ____ I don’t know what’s going on inside me.
14. ____ I often don’t know why I am angry.
15. ____ I prefer talking to people about their daily activities rather than their feelings.
16. ____ I prefer to watch “light” entertainment shows rather than psychological dramas.
17. ____ It is difficult for me to reveal my innermost feelings, even to close friends.
18. ____ I can feel close to someone, even in moments of silence.
19. ____ I find examination of my feelings useful in solving personal problems.
20. ____ Looking for hidden meanings in movies or plays detracts from their enjoyment.
Appendix 7.

Parental Bonding Instrument (PBI)

This questionnaire lists various attitudes and behaviours of parents.

Questions 1 - 25 apply specifically to your MOTHER
Questions 26 - 50 apply specifically to your FATHER

If these questions do not apply to one or both of your parents, please note the reasons why.

---

Place a number next to each question to show how you remember your MOTHER in your first 16 years of life.

RATING SCALE:

1 = Very Like
2 = Moderately Like
3 = Moderately Unlike
4 = Very Unlikely

1. _____ She spoke to me with a warm and friendly voice.

2. _____ She did not help me as much as I needed.

3. _____ She let me do those things I liked doing.

4. _____ She seemed emotionally cold to me.

5. _____ She appeared to understand my problems and worries.

6. _____ She was affectionate to me.

7. _____ She liked me to make my own decisions.

8. _____ She did not want me to grow up.

9. _____ She tried to control everything I did.

10. _____ She invaded my privacy.

11. _____ She enjoyed talking things over with me.

12. _____ She frequently smiled at me.

13. _____ She tended to baby me.
14. ____ She did not seem to understand what I needed or wanted.
15. ____ She let me decide things for myself.
16. ____ She made me feel I wasn’t wanted.
17. ____ She could make me feel better when I was upset.
18. ____ She did not talk with me very much.
19. ____ She tried to make me dependent on her.
20. ____ She felt I could not look after myself unless she was around.
21. ____ She gave me as much freedom as I wanted.
22. ____ She let me go out as often as I wanted.
23. ____ She was over protective of me.
24. ____ She did not praise me.
25. ____ She let me dress in any way I pleased.
Place a number next to each question to show how you remember your FATHER in your first 16 years of life.

RATING SCALE:

1 = Very Like
2 = Moderately Like
3 = Moderately Unlike
4 = Very Unlike

26. ____ He spoke to me with a warm and friendly voice.
27. ____ He did not help me as much as I needed.
28. ____ He let me do those things I liked doing.
29. ____ He seemed emotionally cold to me.
30. ____ He appeared to understand my problems and worries.
31. ____ He was affectionate to me.
32. ____ He liked me to make my own decisions.
33. ____ He did not want me to grow up.
34. ____ He tried to control everything I did.
35. ____ He invaded my privacy.
36. ____ He enjoyed talking things over with me.
37. ____ He frequently smiled at me.
38. ____ He tended to baby me.
39. ____ He did not seem to understand what I needed or wanted.
40. ____ He let me decide things for myself.
41. ____ He made me feel I wasn’t wanted.
42. ____ He could make me feel better when I was upset.
43. ____ He did not talk with me very much.
44. ____ He tried to make me dependent on him.
45. He felt I could not look after myself unless he was around.
46. He gave me as much freedom as I wanted.
47. He let me go out as often as I wanted.
48. He was over protective of me.
49. He did not praise me.
50. He let me dress in any way I pleased.
Appendix 8.

CRQ

Please read each of the following statements and rate the extent to which it describes your feelings about your relationships with others by circling one number in each scale. Think about all of your relationships, past and present, and respond in terms of how you generally feel in these relationships. Some of the questions ask about how you feel about your close relationships generally while other questions ask about romantic relationships. If you have not had a romantic relationship please imagine how you would be likely to feel in one.

1. I find it difficult to allow myself to depend on a romantic partner.
   Strongly Disagree  1  2  3  4  5  6  7  Strongly Agree

2. I often worry that my romantic partner(s) will not want to stay with me.
   Strongly Disagree  1  2  3  4  5  6  7  Strongly Agree

3. It is easy for me to depend on other people.
   Strongly Agree  1  2  3  4  5  6  7  Strongly Disagree

4. I feel comfortable when other people turn to me for help in times of need.
   Strongly Agree  1  2  3  4  5  6  7  Strongly Disagree

5. I prefer not to discuss my problems and concerns with other people.
   Strongly Disagree  1  2  3  4  5  6  7  Strongly Agree

6. I rarely worry about my romantic partner(s) leaving me.
   Strongly Agree  1  2  3  4  5  6  7  Strongly Disagree

7. I do not feel comfortable having other people depend on me.
   Strongly Agree  1  2  3  4  5  6  7  Strongly Disagree

8. Others often want me to be more intimate than I feel comfortable being.
   Strongly Disagree  1  2  3  4  5  6  7  Strongly Agree

9. Usually, I find that romantic partners' feelings are as strong for me as mine are for them.
   Strongly Agree  1  2  3  4  5  6  7  Strongly Disagree

10. I prefer not to be too close with romantic partner(s).
    Strongly Disagree  1  2  3  4  5  6  7  Strongly Agree
11. I feel uncomfortable when other people ‘open up’ to me.
   Strongly Agree 1 2 3 4 5 6 7 Strongly Disagree

12. I get the affection and support I need from my romantic partner(s).
   Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

13. I worry that I will not measure up to other people.
   Strongly Agree 1 2 3 4 5 6 7 Strongly Disagree

14. I am afraid that when someone gets to know me, he or she won’t like who I really am.
   Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

15. My desire to be very close sometimes scares people away.
   Strongly Agree 1 2 3 4 5 6 7 Strongly Disagree

16. I prefer not to show other people how I feel deep down.
   Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

17. I feel comfortable when a romantic partner wants to be very close.
   Strongly Agree 1 2 3 4 5 6 7 Strongly Disagree

18. My romantic partner(s) only seems to notice me when I am angry.
   Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

19. I find it difficult to trust other people completely.
   Strongly Agree 1 2 3 4 5 6 7 Strongly Disagree

20. I tell my romantic partner(s) just about everything.
   Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

21. I am very comfortable being close to other people.
   Strongly Agree 1 2 3 4 5 6 7 Strongly Disagree

22. When I show my feelings for other people, I am afraid they will not feel the same about me.
   Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree
23. It is easy for me to be affectionate with people I care about.
   Strongly Disagree  1  2  3  4  5  6  7  Strongly Agree

24. My romantic partner(s) really understands me and my needs.
   Strongly Agree  1  2  3  4  5  6  7  Strongly Disagree

25. I often worry that romantic partners do not really love me.
   Strongly Agree  1  2  3  4  5  6  7  Strongly Disagree

26. When a romantic partner is out of sight, I worry that he or she might become interested in someone else.
   Strongly Disagree  1  2  3  4  5  6  7  Strongly Agree

27. I am afraid that I will lose my romantic partner’s love.
   Strongly Agree  1  2  3  4  5  6  7  Strongly Disagree

28. I feel comfortable sharing my private thoughts and feelings with a romantic partner.
   Strongly Disagree  1  2  3  4  5  6  7  Strongly Agree

29. Sometimes people change their feelings about me for no apparent reason.
   Strongly Disagree  1  2  3  4  5  6  7  Strongly Agree

30. I am comfortable without close emotional relationships.
   Strongly Agree  1  2  3  4  5  6  7  Strongly Disagree

31. I am nervous when other people get too close to me.
   Strongly Disagree  1  2  3  4  5  6  7  Strongly Agree

32. I do not worry very much about my relationships.
   Strongly Agree  1  2  3  4  5  6  7  Strongly Disagree

Thank you for completing this questionnaire.
SELF-EVALUATION QUESTIONNAIRE

Please provide the following information:

Name __________________________ Date __________ S __

Age __________ Gender (Circle) M F T __

DIRECTIONS:

A number of statements which people have used to describe themselves are given below. Read each statement and then circle the appropriate number to the right of the statement to indicate how you feel right now, that is, at this moment. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe your present feelings best.

1. I feel calm ................................................................. 1 2 3 4
2. I feel secure ...................................................................... 1 2 3 4
3. I am tense ........................................................................ 1 2 3 4
4. I feel strained ................................................................... 1 2 3 4
5. I feel at ease ...................................................................... 1 2 3 4
6. I feel upset ........................................................................ 1 2 3 4
7. I am presently worrying over possible misfortunes .............. 1 2 3 4
8. I feel satisfied ..................................................................... 1 2 3 4
9. I feel frightened ................................................................... 1 2 3 4
10. I feel comfortable ............................................................. 1 2 3 4
11. I feel self-confident .......................................................... 1 2 3 4
12. I feel nervous ..................................................................... 1 2 3 4
13. I am jittery ......................................................................... 1 2 3 4
14. I feel indecisive ................................................................. 1 2 3 4
15. I am relaxed ....................................................................... 1 2 3 4
16. I feel content ...................................................................... 1 2 3 4
17. I am worried ...................................................................... 1 2 3 4
18. I feel confused ................................................................... 1 2 3 4
19. I feel steady ....................................................................... 1 2 3 4
20. I feel pleasant ..................................................................... 1 2 3 4

© Copyright 1968,1977 by Charles D. Spielberger. All rights reserved. STAIP-AD Test Form Y
Published by Mind Garden, Inc., Redwood City, CA.
# SELF-EVALUATION QUESTIONNAIRE

**STAI Form Y-2**

**DIRECTIONS**

A number of statements which people have used to describe themselves are given below. Read each statement and then circle the appropriate number to the right of the statement to indicate how you generally feel. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe how you generally feel.

<table>
<thead>
<tr>
<th>Statement</th>
<th>ALMOST NEVER</th>
<th>ALMOST SOMETIMES</th>
<th>SOMETIMES</th>
<th>FREQUENTLY</th>
<th>OFTEN</th>
<th>ALWAYS</th>
</tr>
</thead>
<tbody>
<tr>
<td>21. I feel pleasant</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>22. I feel nervous and restless</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>23. I feel satisfied with myself</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>24. I wish I could be as happy as others seem to be</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>25. I feel like a failure</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>26. I feel rested</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>27. I am &quot;calm, cool, and collected&quot;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>28. I feel that difficulties are piling up so that I cannot overcome them</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>29. I worry too much over something that really doesn't matter</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>30. I am happy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>31. I have disturbing thoughts</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>32. I lack self-confidence</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>33. I feel secure</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>34. I make decisions easily</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>35. I feel inadequate</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>36. I am content</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>37. Some unimportant thought runs through my mind and bothers me</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>38. I take disappointments so keenly that I can't put them out of my mind</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>39. I am a steady person</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>40. I get in a state of tension or turmoil as I think over my recent concerns and interests</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Appendix 10.

Instructions: This questionnaire consists of 21 groups of statements. Please read each group of statements carefully, and then pick out the one statement in each group that best describes the way you have been feeling during the past two weeks, including today. Circle the number beside the statement you have picked. If several statements in the group seem to apply equally well, circle the highest number for that group. Be sure that you do not choose more than one statement for any group, including Item 16 (Changes in Sleeping Pattern) or Item 18 (Changes in Appetite).

1. Sadness
   0 I do not feel sad.
   1 I feel sad much of the time.
   2 I am sad all the time.
   3 I am so sad or unhappy that I can’t stand it.

2. Pessimism
   0 I am not discouraged about my future.
   1 I feel more discouraged about my future than I used to be.
   2 I do not expect things to work out for me.
   3 I feel my future is hopeless and will only get worse.

3. Past Failure
   0 I do not feel like a failure.
   1 I have failed more than I should have.
   2 As I look back, I see a lot of failures.
   3 I feel I am a total failure as a person.

4. Loss of Pleasure
   0 I get as much pleasure as I ever did from the things I enjoy.
   1 I don’t enjoy things as much as I used to.
   2 I get very little pleasure from the things I used to enjoy.
   3 I can’t get any pleasure from the things I used to enjoy.

5. Guilty Feelings
   0 I don’t feel particularly guilty.
   1 I feel guilty over many things I have done or should have done.
   2 I feel quite guilty most of the time.
   3 I feel guilty all of the time.

6. Punishment Feelings
   0 I don’t feel I am being punished.
   1 I feel I may be punished.
   2 I expect to be punished.
   3 I feel I am being punished.

7. Self-Dislike
   0 I feel the same about myself as ever.
   1 I have lost confidence in myself.
   2 I am disappointed in myself.
   3 I dislike myself.

8. Self-Criticalness
   0 I don’t criticize or blame myself more than usual.
   1 I am more critical of myself than I used to be.
   2 I criticize myself for all of my faults.
   3 I blame myself for everything bad that happens.

9. Suicidal Thoughts or Wishes
   0 I don’t have any thoughts of killing myself.
   1 I have thoughts of killing myself, but I would not carry them out.
   2 I would like to kill myself.
   3 I would kill myself if I had the chance.

10. Crying
   0 I don’t cry anymore than I used to.
    1 I cry more than I used to.
    2 I cry over every little thing.
    3 I feel like crying, but I can’t.

Subtotal Page 1

Continued on Back
11. Agitation
0  I am no more restless or wound up than usual.
1  I feel more restless or wound up than usual.
2  I am so restless or agitated that it's hard to stay still.
3  I am so restless or agitated that I have to keep moving or doing something.

12. Loss of Interest
0  I have not lost interest in other people or activities.
1  I am less interested in other people or things than before.
2  I have lost most of my interest in other people or things.
3  It's hard to get interested in anything.

13. Indecisiveness
0  I make decisions about as well as ever.
1  I find it more difficult to make decisions than usual.
2  I have much greater difficulty in making decisions than I used to.
3  I have trouble making any decisions.

14. Worthlessness
0  I do not feel I am worthless.
1  I don't consider myself as worthwhile and useful as I used to.
2  I feel more worthless as compared to other people.
3  I feel utterly worthless.

15. Loss of Energy
0  I have as much energy as ever.
1  I have less energy than I used to have.
2  I don't have enough energy to do very much.
3  I don't have enough energy to do anything.

16. Changes in Sleeping Pattern
0  I have not experienced any change in my sleeping pattern.
1a I sleep somewhat more than usual.
1b I sleep somewhat less than usual.
2a I sleep a lot more than usual.
2b I sleep a lot less than usual.
3a I sleep most of the day.
3b I wake up 1-2 hours early and can't get back to sleep.

17. Irritability
0  I am no more irritable than usual.
1  I am more irritable than usual.
2  I am much more irritable than usual.
3  I am irritable all the time.

18. Changes in Appetite
0  I have not experienced any change in my appetite.
1a My appetite is somewhat less than usual.
1b My appetite is somewhat greater than usual.
2a My appetite is much less than before.
2b My appetite is much greater than usual.
3a I have no appetite at all.
3b I crave food all the time.

19. Concentration Difficulty
0  I can concentrate as well as ever.
1  I can't concentrate as well as usual.
2  It's hard to keep my mind on anything for very long.
3  I find I can't concentrate on anything.

20. Tiredness or Fatigue
0  I am no more tired or fatigued than usual.
1  I get more tired or fatigued more easily than usual.
2  I am too tired or fatigued to do a lot of the things I used to do.
3  I am too tired or fatigued to do most of the things I used to do.

21. Loss of Interest in Sex
0  I have not noticed any recent change in my interest in sex.
1  I am less interested in sex than I used to be.
2  I am much less interested in sex now.
3  I have lost interest in sex completely.
EDI-2

David M. Garner, PhD.

Directions:

Please enter your age, marital status, and occupation. Complete the questions on the rest of this page. Then turn over the page to the remainder of this questionnaire and follow the instructions.

Age: Marital Status: Occupation:

A. *Current weight:

B. *Height:

C. Highest past weight excluding pregnancy:
   How long ago did you first reach this weight?
   How long did you weigh this weight?

D. *Lowest weight as an adult:
   How long ago did you first reach this weight?
   How long did you weigh this weight?

E. What weight have you been at for the longest period of time?
   At what age did you first reach this weight?

F. If your weight has changed a lot over the years, is there a weight that you keep coming back to when you are not dieting? Yes No
   If yes, what is this weight?
   At what age did you first reach this weight?

G. What is the most weight you have ever lost?
   Did you lose this weight on purpose? Yes No
   What weight did you lose to?
   At what age did you reach this weight?

H. What do you think your weight would be if you did not consciously try to control your weight?

I. How much would you like to weigh?

J. Age at which weight problems began (if any):

K. Father’s occupation:

L. Mother’s occupation:
Instructions
The following items ask about your attitudes, feelings, and behaviour. Some of the items relate to food or eating. Other items ask about your feelings about yourself. For each item decide if the item is true about you ALWAYS (A), USUALLY (U), OFTEN (O), SOMETIMES (S), RARELY (R), OR NEVER (N). Please circle the letter that corresponds to your rating for each item. For example, if your rating for an item is OFTEN, you would circle the O for that item. Please respond to all of the items, making sure that you circle the letter for the rating that is true about you. If you need to change an answer, make an "X" through the incorrect letter and then circle the correct one.

1. I eat sweets and carbohydrates without feeling nervous.  
2. I think that my stomach is too big.  
3. I wish that I could return to the security of childhood.  
4. I eat when I am upset.  
5. I stuff myself with food.  
6. I wish that I could be younger.  
7. I think about dieting.  
8. I get frightened when my feelings are too strong.  
9. I think that my thighs are too large.  
10. I feel ineffective as a person.  
11. I feel extremely guilty after overeating.  
12. I think that my stomach is just the right size.  
13. Only outstanding performance is good enough in my family.  
14. The happiest time in life is when you are a child.  
15. I am open about my feelings.  
16. I am terrified of gaining weight.  
17. I trust others.  
18. I feel alone in the world.  
19. I feel satisfied with the shape of my body.  
20. I feel generally in control of things in my life.  
21. I get confused about what emotion I am feeling.  
22. I would rather be an adult than a child.  
23. I can communicate with others easily.  
24. I wish I were someone else.  
25. I exaggerate or magnify the importance of weight.  
26. I can clearly identify what emotion I am feeling.  
27. I feel inadequate.  
28. I have gone on eating binges where I felt that I could not stop.
29 As a child, I tried very hard to avoid disappointing my parents and teachers.

30 I have close relationships.

31 I like the shape of my buttocks.

32 I am preoccupied with the desire to be thinner.

33 I don’t know what’s going on inside me.

34 I have trouble expressing my emotions to others.

35 The demands of adulthood are too great.

36 I hate being less than best at things.

37 I feel secure about myself.

38 I think about bingeing (overeating).

39 I feel happy that I am not a child anymore.

40 I get confused as to whether or not I am hungry.

41 I have a low opinion of myself.

42 I feel that I can achieve my standards.

43 My parents have expected excellence of me.

44 I worry that my feelings will get out of control.

45 I think my hips are too big.

46 I eat moderately in front of others and stuff myself when they are gone.

47 I feel bloated after eating a normal meal.

48 I feel that people are happiest when they are children.

49 If I gain a pound, I worry that I will keep gaining.

50 I feel that I am a worthwhile person.

51 When I am upset, I don’t know if I am sad, frightened, or angry.

52 I feel that I must do things perfectly or not do them at all.

53 I have the thought of trying to vomit in order to lose weight.

54 I need to keep people at a certain distance (feel uncomfortable if someone tries to get too close).

55 I think that my thighs are just the right size.

56 I feel empty inside (emotionally).

57 I can talk about personal thoughts or feelings.

58 The best years of your life are when you become an adult.

59 I think my buttocks are too large.

60 I have feelings I can’t quite identify.

61 I eat or drink in secrecy.

62 I think that my hips are just the right size.

63 I have extremely high goals.
64 When I am upset, I worry that I will start eating.
65 People I really like end up disappointing me.
66 I am ashamed of my human weaknesses.
67 Other people would say that I am emotionally unstable.
68 I would like to be in total control of my bodily urges.
69 I feel relaxed in most group situations.
70 I say things impulsively that I regret having said.
71 I go out of my way to experience pleasure.
72 I have to be careful of my tendency to abuse drugs.
73 I am outgoing with most people.
74 I feel trapped in relationships.
75 Self-denial makes me feel stronger spiritually.
76 People understand my real problems.
77 I can’t get strange thoughts out of my head.
78 Eating for pleasure is a sign of moral weakness.
79 I am prone to outbursts of anger or rage.
80 I feel that people give me the credit I deserve.
81 I have to be careful of my tendency to abuse alcohol.
82 I believe that relaxing is simply a waste of time.
83 Others would say that I get irritated easily.
84 I feel like I am losing out everywhere.
85 I experience marked mood shifts.
86 I am embarrassed by my bodily urges.
87 I would rather spend time by myself than with others.
88 Suffering makes you a better person.
89 I know that people love me.
90 I feel like I must hurt myself or others.
91 I feel that I really know who I am.