# Does Insecure Attachment Mediate the Relationship between Cyclothymic Temperament and Relationship Satisfaction?

Sarah Elizabeth Fraser

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Faculty of Health, Arts and Design

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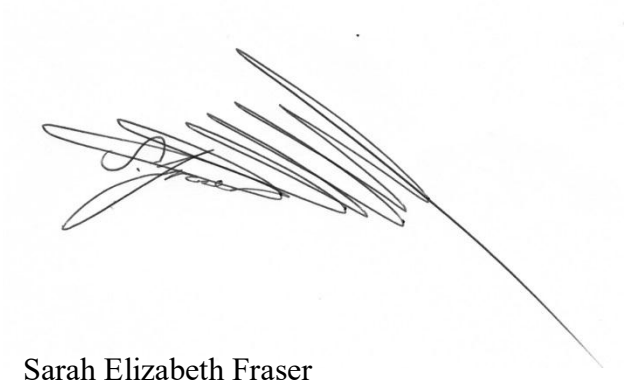
## DECLARATION

I declare that this dissertation is my own account of my research and does not contain work that has been previously submitted for a degree at any institution, except where due reference has been made. The ethical principles for research as stipulated by the Australian Psychological Society and Swinburne University of Technology have been adhered to in this research.

Signed:



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> "*An illness that is unique in conferring advantage and pleasure, yet one that brings in its wake almost unendurable suffering and, not infrequently, suicide"* (Jamison, 1996).

## ABSTRACT

Bipolar disorder (BD) is a severe psychiatric condition associated with serious deleterious shifts in mood, thinking and behaviour. Although disturbed relationship functioning is a known correlate of clinically diagnosable BD, little is known about how people with BD operate in close relationships. There is an abundance of literature connecting Cyclothymic temperament to clinically diagnosable BD. In this study, *Cyclothymic temperament* (measured on the TEMPS-Cyclothymic scale) is assumed to be part of a broader bipolar spectrum that is conceptualized as a quantitative trait. Rapid and continuous fluctuations between subclinical hypomania and subclinical depression are the defining features of Cyclothymic temperament. Evidence suggests that the presence of Cyclothymic temperament predisposes a person to developing BD. The aim of this cross-sectional study was to illuminate the relationship issues often experienced by people with BD, by measuring Cyclothymic temperament and investigating its correlation with relationship satisfaction in a non-clinical sample. *Relationship satisfaction,* defined as an individual's subjective evaluation of the positivity of feelings for one's partner, is thought to play a central role in shaping the quality of people's lives.

This study expands on empirical research that has demonstrated that two insecure attachment dimensions, the *anxious attachment* dimension (characterized by fear of abandonment and rejection: measured on the ECR-anxious subscale), and the *avoidant attachment* dimension (characterized by avoidance and discomfort with closeness: measured on the ECR-avoidant subscale) are strongly associated with relationship problems and dissatisfaction in adult close relationships. In people with BD, insecure attachment has also been described. Taken together, these lines of evidence suggest that insecure attachment may act as a mediator in a putative relationship between Cyclothymic temperament and

relationship satisfaction. Investigating this mediation pathway was the overarching aim of this study.

An innovative aspect of the study was to examine the construct of Cyclothymic temperament from two perspectives: as a one-dimensional trait measured on the TEMPS-Cyclothymic, and a two-dimensional model trait in which two interrelated putative dimensions (defined as *hypomania proneness* and *depression proneness*) were separated out (measured on the -GBI-hypomania & GBI-depression subscales). For completeness, a nested model, which combined Cyclothymic temperament as a one-dimensional construct and the two-dimensional assumption, was also tested.

***Method:*** A non-clinical sample of 359 participants (aged 18 – 65 years; 81% women) completed a web-based self-report survey that included dimensional measures of Cyclothymic temperament, hypomania and depression proneness, insecure attachment dimensions, and various features of relationship satisfaction and general well-being.

***Results:*** Path analysis was used to examine three different mediation models (corresponding to one-dimensional, two-dimensional, and a nested model operationalization of Cyclothymic temperament). In all three models, as expected, anxious and avoidant attachment were found to mediate the relationship between Cyclothymic temperament and relationship satisfaction. When Cyclothymic temperament was represented two-dimensionally, results showed that hypomania proneness had weak links to anxious and avoidant attachment, while depression proneness was more strongly linked to the avoidant attachment dimension. A nested model indicated that Cyclothymic temperament can be usefully understood in terms of two related trait dimensions of hypomania and depression proneness that each have a distinct relationship with insecure attachment dimensions and relationship satisfaction.

***Conclusion:*** Within the limits of a cross-sectional design, results of the present study suggest that an underlying insecure attachment may partly explain why people with trait vulnerability to BD experience lower relationship satisfaction. Future studies using longitudinal designs are now needed to strengthen this inference. Should the causal relationship be demonstrated, clinicians treating those with cyclothymic characteristics might assess for low levels of relationship satisfaction as a potential outcome of the sequelae of trait vulnerability to BD and insecure attachment.

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# Chapter One: Introduction

## 1.0 Overview of Chapter One

Chapter One provides an overview of the project. The Chapter begins with the motivation for the study, introduces the key variables investigated in the present study, and then outlines the overarching and specific aims of the project (section 1.1). Chapter One concludes with an overview of the chapter structure of the thesis (section 1.2).

## 1.1 Overview of the project

Bipolar disorder (BD) is a serious mood disorder known to be associated with significant relationship difficulties (Beentjes, Goossens, & Poslawsky, 2012; Coryell et al., 1993; Dore & Romans, 2001; Miklowitz, Goldstein, Nuechterlein, Snyder, & Mintz, 1988; Sheets & Miller, 2010; Whisman, 2007). A wide range of evidence unambiguously suggests that people with clinical BD experience greater conflict (Reinares, Bonnin, Hidalgo-Mazzei, Colom, et al., 2016), relationship problems (Kopeykina et al., 2016; Lahera et al., 2015; Wieser et al., 2016) and have a tendency to be lonelier than those without BD (Giacco, Palumbo, Strappelli, Catapano, & Priebe, 2016; Greenberg, Rosenblum, McInnis, & Muzik, 2014). However, little progress has been made toward understanding how – the mechanisms by which - vulnerability to BD affects close relationships. The motivation of the present project was to address this deficit in the literature, and better understand the association between BD and relationship satisfaction using a quantitative approach to BD. Here, BD was framed using a continuous variable (viz. Cyclothymic temperament in a general population rather than a clinical sample), and the putative mechanisms were investigated through mediation analyses.

Cyclothymic temperament is an affective trait that is defined as abrupt shifts between hypomanic and depressive subclinical moods, with each shift lasting a few days at a time (Akiskal et al., 2000; Akiskal & Mallya, 1987). Cyclothymic temperament is of interest in its

own right as an affective trait in the general population, but also because of it's demonstrated association with BD. In view of the fact that Cylothymic temperament is on a continuum with clinical BD (Akiskal et al., 1977; Akiskal & Mallya, 1987; Angst, 2007; Depue et al., 1981; Ghaemi, 2013; Judd & Akiskal, 2003) there is reason to believe that people from the general population scoring high for Cyclothymic temperament might experience lower levels of relationship satisfaction. The use of a general population sample is important as it may have implications for BD, and might also contribute to a greater understanding of the relationship difficulties and often seen in people with diagnosable BD.

Relationship satisfaction - an individual's subjective evaluation of the positivity of feelings for one's partner (Arriaga, 2001; Hendrick, Dicke, & Hendrick, 1998) is an important aspect of close relationships. Research has shown that individuals with higher levels of relationship satisfaction tend to be involved in more stable relationships, with greater levels of love and fewer problems (Hendrick et al., 1998). This project sought to understand links between Cyclothymic temperament & relationship satisfaction by drawing on attachment theory. Attachment theory, founded by Bowlby (1969; 1973), is not a theory of relationship satisfaction per se, but remains one of the most influential theories for understanding the emotional bond which an individual forms with another person (Bowlby, 1977; 2005; Simpson, Collins, Farrell, & Lee Raby, 2015). Insecure attachment is often conceptualized as two dimensions: anxious attachment is defined by an obsessive preoccupation with one's partner and extreme jealousy. Central to the anxious attachment dimension are extreme anxiety over relationships, concerns about love, separation and abandonment, and an insistent need for extreme closeness (Campbell, 2011; Feeney, 1999a, 1999b). The avoidant attachment dimension refers to an intense fear of intimacy and discomfort with closeness (Brennan, Clark, & Shaver, 1998; Shaver, Belsky, & Brennan, 2000). Both anxious and avoidant attachment have been linked to close relationships that are

marked by emotional highs and lows, and overall relationship dissatisfaction (Guerrero, Farinelli, & McEwan, 2009; Tidwell, Reis, & Shaver, 1996; von Sydow & Ullmeyer, 2001).

From a developmental point of view, attachment theory suggests that individual differences in adult romantic attachment dimensions stem from the quality of the individual's interactions (past or present) with their primary attachment figure (Dinero, Conger, Shaver, Widaman, & Larsen-Rife, 2008; Dykas & Cassidy, 2011; Fraley et al., 2013; Overall, Fletcher, Simpson & Fillo, 2015; Pascuzzo, Cyr, & Moss, 2013). Research focusing on parent-child relationships has provided compelling evidence linking perceived lack of parental care, as well as punitive and unrewarding parenting behaviours to insecure attachment in adulthood (Doinita & Maria, 2015; Einav, 2014; Rholes et al., 2016). Admittedly, the current study is not developmentally rich in that it did not investigate past childhood experiences nor did it investigate relationships longitudinally (i.e., there is only a single snapshot of adult attachment dimensions). However, adult attachment is the proximal manifestation of the theoretically important & potentially clinically useful construct of attachment.

This is not the first study to consider adult attachment as a potentially important mediating variable in an important psychological process. Many previous investigations have been interested in adult attachment (albeit having its roots in early development) as a target for psychological therapies (Bifulco et al., 2006; Byun, Brumariu, & Lyons-Ruth, 2016; Cohen et al., 2017; Hinnen, Sanderman, & Sprangers, 2009; Hocking et al., 2016; Jarnecke & South, 2013; London, Lilly, & Pittman, 2015; Pilton et al., 2016; Rholes et al., 2016; Sheinbaum et al., 2015; Sutton, Simons, Wickrama, & Futris, 2014; Tasca et al., 2013). Many of these studies propose that the attachment framework is a useful addition to psychotherapies, with the demonstration of statistical mediation considered evidence for mechanism status of the attachment variable.

The overarching aim of the current project was to better understand the association between Cyclothymic temperament and relationship satisfaction, specifically focusing on the prediction that this association is mediated by insecure attachment. A further innovative aim was to understand the association between Cyclothymic temperament, insecure attachment and relationship satisfaction while recognising that Cyclothymic temperament can be understood from a two-dimensional perspective (Depue, Krauss, Spoont, & Arbisi, 1989; Depue, Krauss, & Spoont, 1987; Depue & Monroe, 1978; Depue et al., 1981). Thus, the two putative core features of Cyclothymic temperament (hypomanic and depressive traits) were analysed as two separable but related quantitative trait dimensions (described in this thesis as depression proneness and hypomania proneness).

The project had a number of secondary aims. (1) To develop a more comprehensive understanding of relationship satisfaction, a series of analyses were also conducted to investigate external correlates of relationship satisfaction. That is, the current project examined additional features of a relationship that might be important to levels of relationship satisfaction. These included: relationship status, Cyclothymic Relationship Scale (CRS) scores, the ability to maintain a relationship (rated on a 5-point scale), relationship duration and overall life satisfaction and well-being. (2) The project also had a distinct secondary aim. This aim was to develop a new measure that, if the present mediation hypotheses were confirmed, could be used in future research to explore the process (Cyclothymic temperament – insecure attachment - relationship satisfaction) in more depth. This measure was named the Cyclothymic Relationship Scale (CRS) and integrated cognitive, emotional and behavioural domains of Cyclothymic moodiness within the context of a close relationship. Importantly, development of the CRS was an exploratory aspect of the project, and so the CRS was not used in testing the study's core mediational hypothesis.

To achieve the project's primary and secondary aims, a single cross-sectional self-report survey was conducted with a sample of non-clinical adults. The dimensions of affective functioning investigated (specifically, Cyclothymic temperament and hypomania proneness and depression proneness) are conceptually and causally related to clinical BD (Akiskal, Hantouche, & Allilaire, 2003; Hantouche, Angst, & Akiskal, 2003; Parker, McCraw, & Fletcher, 2012; Perugi, Fornaro, & Akiskal, 2011). The project's specific hypotheses were partly generated from research investigating clinical BD from a relationship and attachment viewpoint. Likewise, it was expected that the findings of the present nonclinical project would have implications for understanding relationship functioning in diagnosable BD.

### 1.2 Chapter structure of the project

Chapter Two introduces the concept of temperament and addresses some major definitional issues. In particular, the work of Akiskal and Mallya (1987) and their concept of affective temperaments (Cyclothymic, hyperthymic, depressive, irritable and anxious temperament) is described, paying particular attention to Cyclothymic temperament. Next, the various ways in Cyclothymic temperament is associated with BD are outlined (section 2.1). After concluding that there are multiple ways in which Cyclothymic temperament is associated with BD, a thorough account of the categorical (section 2.2), ordinal (section 2.3) and quantitative trait approaches (section 2.4) is offered. A review of literature related to Cyclothymic temperament (section 2.4.1), a two-dimensional approach to trait vulnerability to BD (section 2.4.2), and other associations between temperament and BD (section 2.5) is also offered.

In Chapter Three, a review of attachment theory is presented (section 3.1). This includes research regarding caregiver responses and how they influence the development of insecure attachment (section 3.2). This is followed with empirical studies that outline the

various attachment dimensions observed in both infants (section 3.3) and adults (section 3.4). Following this, the cognitive representations of self (section 3.5), emotion regulation strategies (section 3.6) and relationship outcomes (section 3.7) of insecurely attached individuals are discussed. Finally, a review of literature suggesting attachment in adulthood is potentially malleable is also presented (section 3.8).

Chapter Four reviews recent evidence supporting the view that insecure attachment is associated with clinical BD and Cyclothymic temperament (section 4.1). Given the fact that Cyclothymic temperament is related to clinical BD, the literature regarding the development of BD across the lifespan is also presented (section 4.2). Taking advantage of the assumption that Cyclothymic temperament is on a continuum with clinical BD, a brief review of the prevalence of the bipolar spectrum (section 4.3) and age of onset (section 4.4) is also presented.

Chapter Five reviews all relevant empirical literature concerning the bipolar spectrum and relationship outcomes (section 5.1). This includes literature pertaining to clinical BD and relationship status (section 5.2). Next, to illuminate the impact BD can have on close relationships, key studies addressing BD and family functioning and the challenges of caring for someone with BD are briefly described (section 5.3). This section also includes a review of literature emphasizing insecure attachment as a mechanism of change in people with BD (section 5.3.4)

On the basis of the literature presented, Chapter Six presents the studies rationale (section 6.1), aims (section 6.2), hypotheses and research questions (section 6.3 to 6.6). Chapter Seven presents the project methods. This includes information on the participants (section 7.1), study design (section 7.2) demographics (section 7.3), psychometric measures used (sections 7.4 to 7.10), the study procedure (section 7.11) and statistical methods (section 7.12). Chapter Eight initially describes the data screening process (sections 8.1). This is

followed by the projects results (sections 8.2 to 8.5). Finally, Chapter Nine contains a critical discussion of the findings of the current project (sections 9.1 to 9.7), reviews the study's limitations (section 9.8), and considers clinical and theoretical implications of the present findings (section 9.9). The chapter ends with a final conclusion (section 9.10).

# Chapter Two: Cyclothymic Temperament and its Association with Categorical BD

## 2.0 Overview of Chapter Two

The Diagnostic and Statistical Manual of Mental Disorders, fifth edition (DSM-5: American Psychiatric Association, 2013) defines the boundary between BD pathology and normality based on a precise set of binary criteria and presenting clinical features (section 2.2). This view is not shared by all researchers. This chapter reviews the literature suggesting that there still remains much current disagreement about the boundaries of BD subtypes. Research suggests that by applying a categorical cut-off on dimensional features such as symptom severity, frequency and duration, as well as neglecting the frequent comorbid symptoms that can occur in the same individual, the categorical diagnostic classification has significant limitations (Brown & Barlow, 2009; Clay, 2011; Insel et al., 2010; Watson, 2005). Furthermore, research suggests that the categorical diagnostic system may be too stringent to detect clinically significant bipolar psychopathology in the general population (Lewinsohn, Klein, & Seeley, 1995; Walsh et al., 2012). In this chapter, it will be argued that the notion of a broader bipolar spectrum is important (Akiskal et al., 2000) in that it offers the advantage of a dimensional structure that integrates a more extensive range of psychopathology to recognise individuals with lifelong Cyclothymic temperament and subclinical bipolar spectrum conditions. It also has the additional advantage that it may identify people at risk for the development of clinical bipolar illness, promote early intervention and treatment and lessen the chance of progression to bipolar illness (Angst, 2007; Karam et al., 2014; Marneros, 2001; Walsh et al., 2012). Before addressing the various ways in which Cyclothymic temperament may be related to BD (sections 2.3, 2.4 and 2.5), it is first important to offer a definition of what is meant by temperament, and then introduce the concept of affective temperament (section 2.1) .

## 2.1 Temperament and the Origins of Affective Temperament

Temperament refers to stable personality traits and ways of reacting that characterize individuals and remain constant across diverse situations (Vazquez & Gonda, 2013). Typically, temperament describes the temporally stable core of personality and refers to an individual's activity levels, rhythms, moods and related cognitions as well as their variability (Rihmer, Akiskal, Rihmer, & Akiskal, 2010). The concept of affective temperament can be traced back to the ancient Greeks and Romans. Early physicians such as Hippocrates and Galen (around 200 BCE) based their theories of affective temperament on four humours of the body which included blood, phlegm, yellow bile and black bile (Rothbart, Ahadi, & Evans, 2000). Individuals with a predominance of blood were described as socially outgoing and positive (elevated, euphoric mood), while those with excessive amounts of black bile were regarded as sad and anxious with depressed, anhedonic mood (Rothbart et al., 2000).

Modern concepts of affective temperament stem from the work of the German psychiatrist Emil Kraepelin (1921). Kraepelin extended the classic works of Galen, and was the first to conceptualize a link between affective temperaments and affective disorders under the rubric *manic-depressive insanity* – now known as major affective disorders (e.g., schizoaffective, bipolar disorders and unipolar disorders). Kraepelin described four "fundamental states" (depressive, manic, cyclothymic, and irritable) as the subclinical long term traits of manic-depressive insanity, which could be found not only in patients with clinical BD but also among their healthy offspring. The construct of "fundamental states" was not accepted by mainstream psychiatry until the 1970's, when Akiskal and colleagues managed to save it from relative obscurity (Akiskal, Khani, & Scott-Strauss, 1979; Akiskal, Djenderedjian, Rosenthal, & Khani, 1977).

The Kraepelinian tradition was revitalized and redeveloped based on extensive clinical observations and theoretical considerations by Akiskal and Mallya (1987). Like

Kraepelin, these researchers presented an approach that also attempted to establish a relationship between affective temperament and major affective disorders. Akiskal's model similarly proposed four underlying affective temperamental traits: *cyclothymic, hyperthymic, depressive* or *irritable* temperaments (Akiskal & Mallya, 1987). Later, for completeness, Akiskal and his colleagues added an *anxious* temperament (Akiskal, Akiskal, Haykal, et al., 2005; Akiskal, Mendlowicz, et al., 2005). These quantitative traits are described as relatively stable expressions of affect that are the basic phenotypes that reflect the genetic vulnerability to BD (Akiskal, 2007; Akiskal & Akiskal, 2005b; DeGeorge, Walsh, Barrantes-Vidal, & Kwapil, 2014; Di Florio et al., 2010; Kelsoe, 2003).

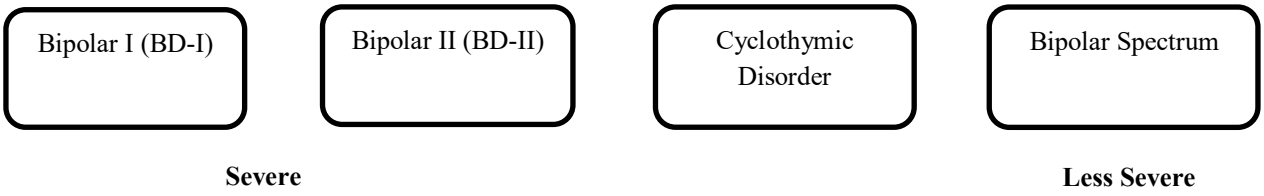
This concept of affective temperaments was eventually used in the construction of a 110-item self-report instrument called the Temperament Evaluation of Memphis, Pisa, Paris & San Diego Auto-questionnaire (TEMPS-A: Akiskal, Akiskal, Haykal, et al., 2005). This recently developed instrument aims to measure the extent to which the aforementioned five affective dispositions are present or absent in a person (Akiskal & Akiskal, 2005a; Akiskal, Akiskal, Haykal, et al., 2005). There is also an interview version (TEMPS-I: Akiskal et al., 1998; Placidi, Maremmani, Signoretta, Liguori, & Akiskal, 1998; Placidi, Signoretta, et al., 1998), a shortened version consisting of 39 items (Akiskal, Mendlowicz, et al., 2005), a 50-item clinical version (Akiskal, Akiskal, Haykal, et al., 2005), and a version adapted for children (Kochman et al., 2005).

The TEMPS-A has been used extensively in large epidemiological studies (Akiyama et al., 2005; Borkowska et al., 2010; Erfurth, Gerlach, Hellweg, et al., 2005; Fountoulakis et al., 2014; Hinic, Akiskal, Akiskal, Jovic, & Ristic, 2013; Karam, Mneimneh, Salamoun, Akiskal, & Akiskal, 2005; Lin et al., 2013; Pompili et al., 2008; Rozsa et al., 2008; Vazquez et al., 2007). Research has found that up to 20% of the general population have high levels of affective temperament (2 *SD* above the mean), with depressive, cyclothymic and anxious

temperament being more common among women, whereas hyperthymic and irritable temperaments predominate among men (Erfurth, Gerlach, Michael, et al., 2005; Rihmer et al., 2010; Vazquez, Tondo, Mazzarini, & Gonda, 2012). Affective temperaments can significantly affect the long-term course of mood disorders and outcome, including suicidality and other forms of self-destructive behaviours such as substance use and eating disorders (Rihmer et al., 2010).

1. The Categorical Perspective


2. The Ordinal Perspective

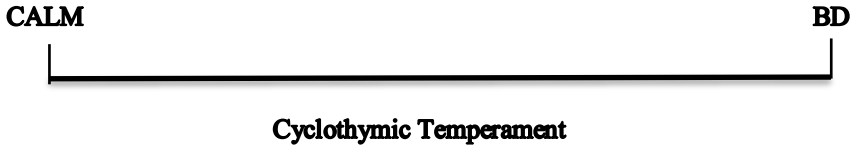



3. Quantitative trait Perspective

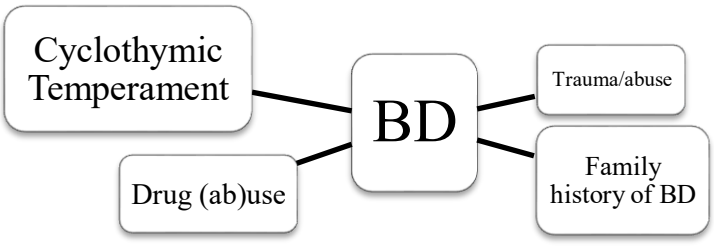
One - dimensional = Cyclothymic temperament (Akiskal & Mallya, 1987)

Two - dimensional = Depression proneness (Depue, Krauss et al., 1989 )
Hypomania proneness

a) Cyclothymic temperament is continuous with a diagnosis of BD




b) Cyclothymic temperament is one of many identified *risk* factors for BD




c) Episodes of illness change temperament (*Scar* hypothesis: Lewinsohn, Steinmetz, Larson & Franklin, 1981).

*Figure 1*. The project's quantitative trait predictor variables and relationships with categorical BD.

Figure 1 depicts the numerous ways in which Cyclothymic temperament may be related to categorical BD. These are described in detail in the following section.

## 2.2 Categorical Perspective: diagnosing BD

Categorical BD is described in the DSM-5 (APA, 2013) as a group of affective disorders, characterized by depressive and manic or hypomanic episodes. Using the DSM-5 criteria, a division can be made between unaffected individuals and those with diagnosable BD. However, BD presentations are multifaceted in that they can occur in multiple forms with varying degrees of severity. The frequency and severity of the cycles of abnormal affect, energy, cognition and behaviour can vary from person to person and can be expressed at clinical or subclinical levels (Walsh, Royal, Brown, Barrantes-Vidal, & Kwapil, 2012). The clinical picture is further complicated by mixed states, a rapid cycling variant, common comorbid anxiety, and comorbid substance abuse (Malhi, Bargh, Cashman, Frye, & Gitlin, 2012; Marneros & Goodwin, 2005; Perugi & Akiskal, 2005). Figure 2 shows the classical patterns of BD:

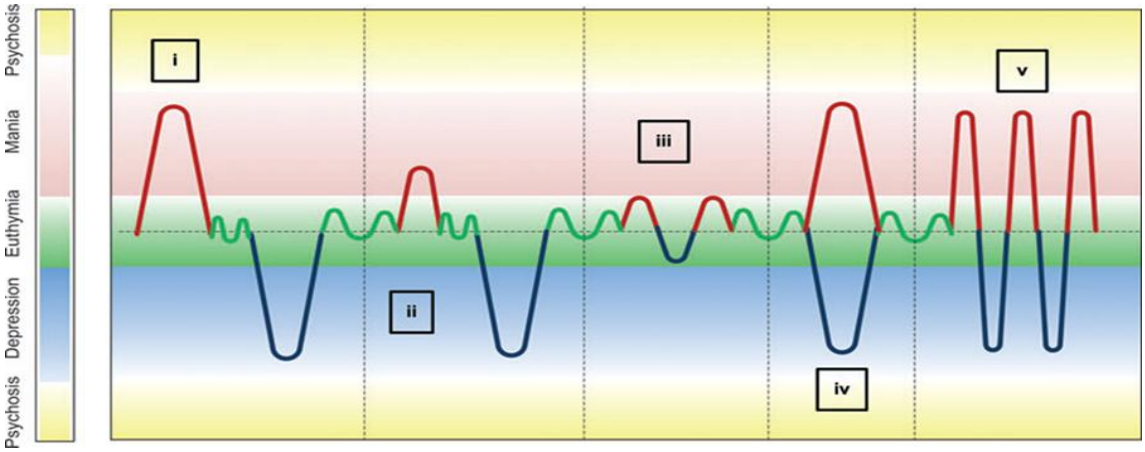



*Figure 2.* The core pattern of BD: i = BD-I; ii = BD-II; iii = subsyndromal bipolar symptoms; iv = mixed states; v = rapid cycling: red – hypo/mania; blue = depression; green = euthymia (from Malhi, G.S., Bargh, D.M., Cashman, E., Frye, M.A., & Gitlin, M. (2012). *The clinical management of bipolar disorder complexity using a stratified model.* Bipolar Disorders, 14, Suppl 2, 66-89.

## 2.3 The Ordinal Perspective

The ordinal perspective suggests that categorical subtypes lie on a continuum with clinical BD (Akiskal, 2007; Akiskal, Akiskal, Lancrenon, & Hantouche, 2006; Akiskal et al., 2000; Ghaemi, 2013; Ghaemi & Dalley, 2014; Goto, Terao, Hoaki, & Wang, 2011). Research suggests that many people with BD do not fit into the strict categorical descriptions of DSM-5 (Akiskal, 2007; Ghaemi & Dalley, 2014; Phelps, Angst, Katzow, & Sadler, 2008; Phillips & Kupfer, 2013; Rovai, Maremmani, Rugani, et al., 2013). Marneros (2001, p.41) concluded "it is still not absolutely clear, what and where the boundaries are between the other bipolar disorders, cyclothymia and a cyclothymic personality or cyclothymic temperament." This view has led to a multitude of terms such as sub-threshold, subclinical, and subsyndromal, all of which are empirical divisions of convenience used to describe trait-related bipolar manifestations that are comparable to categorical BD but do not meet DSM-5 criteria (Akiskal, 2007; Phelps et al., 2008; Phillips & Kupfer, 2013). The term *bipolar spectrum* will primarily be used in this thesis, as it is perhaps the most widely used term that associates trait vulnerability to BD to categorical BD (Akiskal & Mallya, 1987).

### 2.3.1 BD-I and mania.

As previously mentioned, research suggests that Cyclothymic temperament is closely associated with DSM-5 BD. As shown in Figure 1, the ordinal perspective implies an order of bipolar severity, starting at less severe bipolar spectrum forms, and progressing through to cyclothymic disorder, Bipolar Disorder type II (BD-II) and Bipolar Disorder type I (BD-I). BD-I is characterized by one or more manic episodes and is generally accepted as representative of the most 'severe' end of the bipolar spectrum (Angst, 2007). The manic episode may be preceded and/or followed by hypomanic or major depressive episodes (DSM-5: APA, 2013). Manic episodes are often associated with psychotic symptoms such as delusions, thought disorder, and hallucinations. Hospitalization is often necessary and

interpersonal functioning is noticeably impaired (Emilien, Septien, Brisard, Corruble, & Bourin, 2007; Gazalle et al., 2007). The criteria for clinical diagnosis of BD-I are contained in Appendix A.

### *2.3.2 BD-II and hypomania.*

Bipolar Disorder type II (BD-II) is characterized in the DSM-5 by the combination of at least one hypomanic episode plus one major depressive episode. The criteria for a clinical diagnosis of BD-II are contained in Appendix A. The syndrome of hypomania is often regarded as a less severe form of mania, and is especially difficult to detect, as unlike mania, the onset of hypomania can be extremely insidious (Berk, Berk, Moss, Dodd, & Malhi, 2006). Recognising this implied milder clinical expression of hypomania is often difficult, as increased energy and mood overlaps with periods of nonclinical wellness or normal liveliness (Angst, 2006). These often relatively minor expressions of mood elevation can, in some BD-II individuals, actually improve interpersonal functioning (Furnham, Batey, Anand, & Manfield, 2008; Mackali, Guloksuz, & Oral, 2014).

Individual failure to recognize or subsequently remember periods of hypomania is known to contribute to under-diagnosis of BD-II (Akiskal & Benazzi, 2005; Angst et al., 2011; Howland, 2006; Karam et al., 2014). Misdiagnosis as unipolar depression can lead to administration of antidepressants as monotherapy which (when not combined with a mood stabilizer such as lithium), is not only less effective in the treatment of individuals with an underlying bipolar depression (Sachs et al., 2007) but increases the risk of a manic switch or cycle acceleration (Bowden, 2005). The consequences of a delayed or incorrect diagnosis of BD can be devastating. There is a high risk of suicide attempts in both individuals with BD-I and BD-II (Rihmer & Kiss, 2002; Simpson & Jamison, 1999; Tidemalm, Haglund, Karanti, Landen, & Runeson, 2014). In BD-II, suicide attempts are 30 times more likely during the depressive phase than during the hypomanic phase (Compton & Nemeroff, 2000).

In an attempt to reduce the likelihood of a misdiagnosis and improve recognition of milder hypomanic expressions, several self-report instruments such as the Mood Disorder Questionnaire (MDQ: Hirschfeld et al., 2000), General Behaviour Inventory (GBI: Depue et al., 1989), Hypomanic Personality Scale (HPS: Eckblad & Chapman, 1986), and the TEMPS-A (Akiskal et al., 2005) have been developed. These measures offer some assistance in the recognition of hypomania; however, they do not resolve the diagnostic problems associated with this complex mood manifestation. For example, the utility of the MDQ in routine clinical practice is uncertain. A recent study found a high false-positive rate on the MDQ in a heterogeneous sample of psychiatric patients (Zimmerman et al., 2010). These authors found that among 98 patients screening positive for BD on the MDQ, 23.5% were diagnosed with BD, and 27.6% were incorrectly diagnosed with borderline personality disorder (BPD). BPD is a chronic personality disorder characterised by maladaptive cognitions and enduring instability of affect that includes patterns of extreme volatility and intense anger (or difficulty controlling anger), 'frantic efforts to avoid real or imagined abandonment,' problematic interpersonal problems and unstable self-image. The mood of a person with BPD is highly reactive and can change quickly between a range of negative affect including feelings of loneliness and emptiness, rage and sadness (DSM-5: APA, 2013). Zimmerman et al. (2010) found that BPD was four times more frequently diagnosed in the MDQ positive group than in the MDQ negative group (27.6% and 4.1%, respectively). The authors concluded that the MDQ failed to adequately distinguish between patients who screened positive for BD, and those diagnosed with BPD (Zimmerman et al., 2010). It seems there is still room for improvement when it comes to self-report screening tools for BD (Miller, Johnson, Kwapil, & Carver, 2011).

#### *2.3.2.1 BD-II and depression.*

Although hypomania is the distinguishing feature of BD-II, the mood symptoms extend beyond elevated mood to incorporate recurrent depressive symptoms and episodes. Indeed, many of the complexities in the diagnosis of BD-II arise due to the high frequency of depressive symptoms (Angst, 2006; Judd & Akiskal, 2003; Kaye, 2005). For example, Judd et al., (2003) followed a cohort of 86 patients with BD-II prospectively, naturalistically, and systematically for up to 20 years. Weekly symptomatic analysis showed that the longitudinal symptomatic course of BD-II is chronic and dominated by depressive rather than hypomanic or cycling/mixed symptoms. Furthermore, it was found that BD-II involved the full severity range of subclinical, minor depressive and hypomanic symptoms. In a cohort of 18 adolescents with BD, illness onset was ten times more likely to start with a major or minor depressive episode than a hypomanic episode (Lewinsohn, Klein, & Seeley, 2000).

A large survey conducted over a decade ago on members of the National Depressive and Manic-Depressive Association (DMDA; Lish, Dimemeenan, Whybrow, Price, & Hirschfeld, 1994) found that over one third of patients with BD waited ten years or more to receive a correct diagnosis. These findings are consistent with a more recent study. The 2003 Access Economics report for SANE Australia confirmed that a ten year delay before correct BD diagnosis is not uncommon. The most common alternative diagnoses included depression (60%), anxiety disorder (26%), schizophrenia (18%), and borderline or antisocial personality disorders (17%). People with an eventual BD-II diagnosis are, on average, misdiagnosed 3.5 times (SANE, 2003).

A number of studies involving extended periods of follow-up have illustrated that there is often a switch from a depression diagnosis to BD-II over time (Akiskal et al., 1995; Alloy et al., 2012; Goldberg & Harrow, 2011; Goldberg, Harrow, & Whiteside, 2001). For instance, Ghaemi and associates reported that 40% of patients with an eventual BD diagnosis

initially received an incorrect diagnosis of major depression (Ghaemi, Sachs, Chiou, Pandurangi, & Goodwin, 1999). A fifteen year longitudinal study revealed that 27% of 72 patients initially hospitalized for unipolar major depression subsequently developed one or more distinct periods of hypomania (Goldberg & Harrow, 2011; Goldberg et al., 2001). Similarly, the National Institute of Mental Health (NIMH) Clinical Collaborative Depression study (CDS) followed 559 patients with major depressive disorder for an 11-year period (Akiskal et al., 1995) and, despite applying strict diagnostic criteria at the first assessment, 3.9% were found to have developed BD-I, and an additional 8.6% to have developed BD-II by the follow up observation (Akiskal et al., 1995). These findings show that even when strict diagnostic criteria are applied, a large proportion of people with major depressive disorder go on to develop BD.

When DSM-IV diagnostic criteria (DSM-IV-TR: APA, 2000) were applied to 250 patients with major depressive episodes, 72% of the patients were initially identified as having experienced a major depressive episode and 22% as having experienced hypomania. A comprehensive assessment of hypomania was administered four weeks later to the same patients, of which only 45% met criteria for unipolar depression whereas the rate of BD-II almost doubled to 40% (Hantouche et al., 1998). Research has found that people with BD-II can progress along the bipolar spectrum to a more severe diagnosis of BD-I (Alloy et al., 2012; Birmaher et al., 2009; Birmaher et al., 2006; Joyce et al., 2004). However, BD-II may be more closely related to affective temperament in a way that BD-I is not (Benazzi, 2006b). For instance, affective temperament (based on TEMPS-A Cyclothymic scale) is found to be an integral part of unipolar to BD-II diagnosis but is absent in BD-I diagnosis and in those who remain unipolar (Akiskal et al., 1995; Di Florio et al., 2010; Hantouche et al., 1998; Rovai, Maremmani, Rugani, et al., 2013; Savitz, van der Merwe, & Ramesar, 2008). This is compelling evidence that BD-II is frequently misdiagnosed. Depression is the most

frequently reported symptom, while hypomania is seldom spontaneously conveyed (for a more complete review, see Berk & Dodd, 2005). There are a number of clinical features that may aid in differentiating BD-II disorder from unipolar depression. For instance, BD-II is not only associated with an increase in depressive symptom severity, early age at onset of first depression, recurrent depression, high rates of divorce or separation, a poorer treatment response and a poorer prognosis (Akiskal & Benazzi, 2005; Akiskal et al., 1995; Lewinsohn et al., 2000; Lewinsohn, Seeley, & Klein, 2003) but the data suggest that Cyclothymic temperament is a strong risk factor for progression to BD-II in children with a major depressive disorder (Kochman et al., 2005).

### 2.3.3 Cyclothymic disorder.

The DSM-5 (APA, 2013) defines cyclothymic disorder as chronic, fluctuating mood disturbance involving numerous periods of hypomanic symptoms and periods of depressive symptoms that are distinct from each other. The symptoms must be persistent for at least two years (one year for children or adolescents), during which time the person has no more than two months without marked mood symptoms. Cyclothymic disorder requires the presence of hypomanic symptoms, but not necessarily full episodes, effectively suspending the four-day durational criterion for hypomania (Youngstrom, 2009). Clinicians rarely use this diagnosis in practice (Howland & Thase, 1993; Van Meter, Youngstrom, Youngstrom, Feeny, & Findling, 2011; Van Meter & Youngstrom, 2012; Youngstrom, 2009) and the chronicity associated with cyclothymic disorder also makes it extremely difficult to differentiate from Cyclothymic temperament (Akiskal, Akiskal, Allilaire, et al., 2005; Akiskal et al., 1977; Hantouche & Perugi, 2012; Van Meter, Youngstrom, & Findling, 2012).

### 2.3.4 The bipolar spectrum.

The bipolar spectrum notion extends the number of categorical diagnoses encompassed by the DSM-5 nomenclature to include the addition of a broader spectrum of

categorical bipolar subtypes (Akiskal, 2007; Akiskal, Akiskal, Haykal, et al., 2005; Akiskal, Akiskal, et al., 2006; Cassano, Akiskal, Savino, Musetti, & Perugi, 1992; Goto et al., 2011; Graham, Parker, Breakspear, & Mitchell, 2015; Mynatt, Cunningham, & Manning, 2002). Several different approaches that reflect a broader spectrum of bipolar psychopathology appear in the literature. First, a spectrum relationship may exist between categorical 'subtypes' that lie on a continuum with clinical BD (Akiskal, 1996, 2003, 2004b; Akiskal, 2007; Akiskal, Akiskal, et al., 2006; Akiskal et al., 2000; Akiskal & Pinto, 1999; Ghaemi, 2013; Ghaemi & Dalley, 2014; Ghaemi et al., 2002; Goto et al., 2011). Akiskal and colleagues proposed the addition of a further seven categorical subtypes of bipolar spectrum disorders ranging from bipolar ½ (schizo-bipolar), bipolar II ½ (a complex mix of major depressive episodes superimposed on a Cyclothymic temperament), bipolar III (antidepressant-induced hypomania), bipolar IV (major depression superimposed on a hyperthymic temperament), and other subtypes including depression with a family history of BD and repeated hypomania occurring in the context of substance and/or alcohol (ab)use) (Akiskal, Akiskal, et al., 2006; Akiskal & Pinto, 1999; Goto et al., 2011). These formulations are important in that they expand the diagnosis of BD whilst emphasizing the mixing of bipolar symptoms and affective temperament.

Akiskal's view that relates categorical subtypes and affective temperament to the bipolar spectrum is not the only spectrum approach to BD. Over many decades, a broad range of different spectrum approaches have been developed. For instance, Angst (1978) based his approach on a spectrum distinguishing between hypomania (m), cyclothymia (md), mania (M), mania with mild depression (Md), mania and major depression (MD), and major depression and hypomania (Dm). Klerman (1981) split the bipolar spectrum into various sub-groups (types II, III, IV, V, VI) based on a spectrum of six manic subtypes that extended from classic mania and hypomania, to hypomania or mania precipitated by drugs,

cyclothymic temperament, depression with a family history of bipolar disorder and mania without depression. For Klerman, Cyclothymic temperament falls between normal happiness and hypomania. Ghaemi and Goodwin (2002) simply combined together all the nonclinical bipolar subtypes into one generic bipolar spectrum disorder. Others collapse together bipolar spectrum disorders into a generic higher order of emotional (Brown & Barlow, 2009) and distress disorders (Clark & Watson, 1991).

In addition, a number of other bipolar spectrum disorder models exist in the literature. These include the possible continuum between unipolar depression and BD (Angst, 2007; Ghaemi et al., 2002), BD and schizophrenia (Keshavan et al., 2011; Winokur, Monahan, Coryell, & Zimmerman, 1996) and a spectrum relationship between BD and BPD (Benazzi, 2006a, 2008; Coulston, Tanious, Mulder, Porter, & Malhi, 2012; Deltito et al., 2001; MacKinnon & Pies, 2006; Paris, 2004; Perugi et al., 2013). Specifically, a recent review of the phenomenology of BPD and BD indicated there is considerable overlap between these severe psychiatric disorders (Antoniadis, Samakouri, & Livaditis, 2012).

In sum, multiple definitions of "bipolar spectrum" can be identified. Reflecting its most common use in the current literature, the term bipolar spectrum will refer herein to a continuous distribution of trait vulnerability to BD that falls along a continuum of severity, from normal to pathological presentations (Akiskal et al., 1977; Akiskal & Mallya, 1987; Angst, 2007; Depue et al., 1981; Ghaemi, 2013; Judd & Akiskal, 2003). The scope of the current project is restricted to the putative Cyclothymic temperament – BD-I continuum.

### 2.4 The Quantitative Trait Approach

Figure 1, Model 3 depicts the quantitative trait approach to BD. This extends the notion of a bipolar spectrum and rejects any ideas of categorical diagnosis. Instead the quantitative trait approach assumes that the presence of certain personality characteristics or temperamental traits predisposes the person to developing a clinical disorder (Akiskal &

Mallya, 1987; Clark, 2005; Clark, Watson, & Mineka, 1994; Depue et al., 1989; Depue et al., 1981; Kelsoe, 2003; Widiger & Smith, 2008). From this perspective, BD is conceptualised as the most extreme clinical manifestation of a measurable neurobehavioural trait that is continually distributed throughout the population (Akiskal, 2004a; Akiskal, 2004b; Akiskal, 2007; Akiskal & Mallya, 1987; Akiskal & Pinto, 1999; Kelsoe, 2003). Dimensional quantitative traits and affective disorders are thought to reflect the same underlying process and may themselves fail in some instances to be distinct entities (Phelps et al., 2008). That is, extreme but essentially healthy traits could be confused with clinical disorders. Thus, there are concerns that a spectrum of bipolarity can become so far extended that it may lead practitioners to over-diagnose BD and treat people with intense non-pathological variants of temperament (Kuiper, Curran, & Malhi, 2012; Rovai, Maremmani, Rugani, et al., 2013; Youngstrom, Van Meter, & Algorta, 2010).

The nature and number of potential dimensional traits that underlie predisposition to BD is unknown. Hans Eysenck (1967, 1991, 1997) has suggested that personality or temperament is reducible to three major dimensional traits: neuroticism, extroversion and psychoticism. Other researchers argue that sixteen (Cattell, 1956) or the 'Big Five' (neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness) (Zuckerman, Kuhlman, Joireman, Teta, & Kraft, 1993) are optimal models. Extraversion (the tendency toward assertiveness, high activity/energy levels, sociability, optimism and positive emotions) and neuroticism (the tendency to experience negative affect such as sadness, anxiety, guilt, fear, anger, embarrassment, irrationality, impulsivity, poor coping) have been implicated in trait vulnerability to BD (Akiskal, Kilzieh, et al., 2006; Bagby et al., 1996; Lozano & Johnson, 2001; Murray, Goldstone, & Cunningham, 2007). Evidence suggests that higher trait levels of neuroticism may be a better indicator of vulnerability to a BD diagnosis than extraversion (Jylha et al., 2010). While neuroticism is a global construct which

subsumes, among others, additional traits such as anxiousness and depressiveness, the five affective temperaments mentioned earlier (Cyclothymic, depressive, hyperthymic, irritable, and anxious) proposed by Akiskal and Mallya (1987) are more specifically and individually measured.

### 2.4.1 Cyclothymic temperament.

Kraepelin's classic characterisation of a cyclothymic fundamental state described below appears to anticipate the dimension of affective functioning described by Akiskal and Mallya (1987) as Cyclothymic temperament (Akiskal et al., 2000; Akiskal & Mallya, 1987; Borkowska et al., 2010; Fountoulakis et al., 2014; Lin et al., 2013).

"*These are the people who constantly oscillate hither and thither between the two opposite poles of emotion, sometimes 'rejoicing to the skies', sometimes 'sad as death'. Today, lively sparkling, beaming, full of the joy of life, the pleasure of enterprise, and pressure of activity, after some time they meet us depressed, enervated, ill-humoured, in need of rest, and again a few months later they display the old freshness and elasticity*" (Kraepelin, 1921, p.131).

The scope of the current project is restricted to Cyclothymic temperament for several reasons. First, the relevant literature is so vast that it is necessary to narrow focus. Second, among the five temperaments, Cyclothymic temperament is argued to be the most commonly recognised subclinical trait of BD (Akiskal, 1992a; Akiskal et al., 1977; Akiskal, Hantouche, & Allilaire, 2003; DeGeorge et al., 2014; Hantouche, Angst, & Akiskal, 2003; Parker, McCraw, & Fletcher, 2012; Perugi, Fornaro, & Akiskal, 2011), is commonly found among people with a clinical diagnosis of BD-II (Akiskal, 1996; Akiskal et al., 2003; Akiskal et al., 1995; Cassano et al., 1992; Goto et al., 2011; Hantouche et al., 1998), cyclothymic disorder (Parker et al., 2012), BPD (Benazzi, 2006a; Deltito et al., 2001; Levitt, Joffe, Ennis,

Macdonald, & Kutcher, 1990; Perugi, 2005) and major and atypical depressive cohorts (Kochman et al., 2005; Maina, Salvi, Rosso, & Bogetto, 2010).

By definition, a Cyclothymic temperament should be more or less fixed by the age of 21 years (Akiskal, 1992b; Akiskal & Mallya, 1987; Benazzi, 2009) but it is noticeably evident between the ages of 19 and 26 (Placidi, Maremmani, et al., 1998). The core trait of the Cyclothymic temperament is a rapid, frequent pattern of alternation between hypomanic and depressive subclinical moods, cognitions, and behaviours (Akiskal & Mallya, 1987). This biphasic shift in mood is also accompanied by other cyclic patterns including over-confidence alternating with shaky self-esteem and people-seeking alternating with social avoidance (Akiskal & Mallya, 1987). Irritability is also common, where even minor provocation can result in angry outbursts (Akiskal, 1992b).

Akiskal and Mallya's (1987) formulation of the core pattern of Cyclothymic temperament is summarized in Box 1.

*Box 1*: The core pattern of Cyclothymic temperament (Akiskal & Mallya, 1987).

- Biphasic dysregulation characterized by abrupt endo-reactive shifts from one phase to the other, each phase lasting for a few days at a time, with infrequent euthymia.
- Marked unevenness in quantity and quality of productivity-associated unusual working hours.
- Lethargy alternating with eutonia.
- Pessimistic brooding alternating with optimism and carefree attitudes.
- Mental confusion alternating with sharpened and creative thinking.
- Shaky self-esteem alternating between low self-confidence and overconfidence.
- Hypersomnia alternating with decreased need for sleep.
- Introverted self-absorption alternating with uninhibited people seeking.
- Decreased verbal output alternating with talkativeness.
- Unexplained tearfulness alternating with excessive punning and jocularity.

Notably, when Cyclothymic temperament is co-present with BD-II it is argued to represent a “darker”, more unstable bipolar spectrum disorder characterized by younger age at onset, frequent bouts of depression, suicidality, substance abuse and irritable, volatile risk-taking features (Akiskal et al., 2003; Graham et al., 2015). In comparison, BD-II patients without Cyclothymic temperament exhibit a “sunnier” more euphorically driven disposition (Akiskal et al., 2003; Graham et al., 2015). BD-II associated with the darker core Cyclothymic temperament is likely to be diagnosed as BPD (Benazzi, 2006a, 2008; MacKinnon & Pies, 2006; Perugi, 2005; Perugi et al., 2013; Perugi, Toni, Travierso, & Akiskal, 2003; Smith, Muir, & Blackwood, 2005). Angst (2007) suggests that BPD should be included in the bipolar spectrum as an intermediate step between subclinical BD and

Cyclothymic temperament. Furthermore, when a Cyclothymic temperament and depression with atypical features (e.g., sensitivity to rejection, overeating, oversleeping) come together, they often manifest in prolonged periods of irritability and explosive aggressive outbursts that can last for days (Akiskal et al., 1977; Mechri, La Kerkeni, Touati, Bacha, & Gassab, 2011). The coexistence of Cyclothymic temperament and depressive characteristics greatly increases the risk of suicide (Mechri et al., 2013). Thus, research suggests it is the actual presence of an underlying Cyclothymic temperament diathesis that explains much of the relationship between atypical depression, BD-II, and BPD (Goutaudier, Melioli, Valls, Bouvet, & Chabrol, 2014; Perugi et al., 2011).

### 2.4.2 Hypomania and depression proneness: A two-dimensional perspective on BD.

Two-dimensional theories propose that BD involves two separate but interrelated vulnerabilities, depression and (hypo) mania (Joffe, Young, & MacQueen, 1999; Johnson et al., 2011; Youngstrom, Murray, Johnson, & Findling, 2013). Genetic data also support the contention that (hypo) mania and depression are separable but highly correlated syndromes (McGuffin, Rijsdijk, Sham, Katz, & Cardno, 2003; Merikangas et al., 2014). In addition, two-dimensional models of BD fit with the high prevalence of mixed episodes that can occur in some people with this diagnosis. That is, BD can be characterised less by swings between opposite "poles" of symptoms than by varying admixtures of manic and depressive symptoms, the combination of which is associated with greater dysfunction (Bauer, Simon, Ludman, & Unutzer, 2005).

According to Depue et al. (1981; 1987), the difference between clinical and nonclinical experience of mania-hypomania and depression is arbitrary, in that individuals vary only in degree of expression of these two phenotypes (frequency and severity). That is, Depue and colleagues argue that it is important to separate out two dimensions relevant to

BD vulnerability, namely hypo/mania and depression proneness. Milder trait forms can merge subtly with the normal phenotype, whilst higher trait levels or extreme forms merge with BD.

Some researchers have described a two-dimensional approach in which a combination of excessive or deficient anger and fear traits contributes to BD (Lara, Pinto, Akiskal, & Akiskal, 2006). Murray et al., (2007) and Quilty, Sellbom, Tackett, and Bagby (2009) also explored a two-dimensional trait structure in which extraversion and neuroticism were implicated in trait vulnerability to BD. These researchers found that, although the correlation between extraversion and neuroticism was high, higher trait levels of extraversion were implicated in (hypo) mania proneness, while higher trait levels of neuroticism were found to be the predominant personality characteristic that underlies depression proneness (Murray et al., 2007; Quilty et al., 2009). These complex two-dimensional models are important in that they suggests that in trait vulnerability to BD, hypomania and depression proneness are separate, albeit highly interrelated constructs.

Although primarily a theory of personality and behavioural activity, Gray's biopsychological theory of trait vulnerability to BD (Gray, 1982) could be considered a two-dimensional model. For instance, this model suggests that there are two motivational systems that control behavioural activity. One of these systems, the behavioural activation system (BAS), is hypothesized to regulate approach behaviour to attain rewards and goals, whereas the behavioural inhibition system (BIS) regulates inhibition of behaviour in response to threat and cues of punishment as well as avoidant behaviour (Gray, 1982). Individual differences in the functioning of the BAS are thought to arise from neurochemical variation in the dopaminergic projections of the Ventral Tegmental Area (Depue & Collins, 1999; Depue & Iacono, 1989). Specifically, excessive release of dopamine is assumed to create heightened activation of the BAS (BAS dysregulation). Extreme BAS levels are theorised to be a core

factor in trait vulnerability to BD (Alloy & Abramson, 2010; Alloy et al., 2008; Alloy, Nusslock, & Boland, 2015; Depue & Collins, 1999; Depue et al., 1989; Holzwarth & Meyer, 2006; Urosevic, Abramson, Harmon-Jones, & Alloy, 2008; Van Meter & Youngstrom, 2015). Individuals with clinical BD are reported to have an overly-sensitive BAS that is reflected in hypomanic/manic symptoms such as euphoria, excessive goal-seeking behaviour, decreased need for sleep, irritability, inflated self-esteem and increased talkativeness (Alloy et al., 2015; Depue & Collins, 1999; Depue & Iacono, 1989; Depue et al., 1989; Depue et al., 1987; Nusslock, Abramson, Harmon-Jones, Alloy, & Coan, 2009; Van Meter & Youngstrom, 2015). In contrast, depressive symptoms such as sadness, low energy, anhedonia, psychomotor retardation, and hopelessness reflect a shutdown or excessive decrease in BAS in response to BAS deactivation-relevant events such as definite failure and non-attainment of a desired goal (Alloy et al., 2015; Depue et al., 1987; Nusslock et al., 2009).

The two-dimensional models discussed here suggest that both clinical (hypomanic and depressive symptoms) and nonclinical phenomenology of BD (hypomania and depression proneness) encompass two divergent but interrelated forms, where hypomanic behaviours mark the high extreme, and depressive behaviours the low extreme (Depue et al., 1987).

### 2.5 Other associations between temperament and BD

Another possibility is that temperaments are risk factors or precursors of affective disorders (Akiskal, 2007; Alloy et al., 2012; Clark, 2005). Other important risk factors that may exacerbate the transition to BD are life stressors, including drug (ab)use, trauma, childhood maltreatment, poor parenting, exposure to parental BD, and a family history of BD (Alloy et al., 2005; Bender & Alloy, 2011; Duffy et al., 2007; Duffy et al., 2012; Neeren, Alloy, & Abramson, 2008; Rovai, Maremmani, Bacciardi, et al., 2013). A pathoplastic relationship assumes that temperament and BD can influence the presentation or appearance

of one another (De Bolle, Beyers, De Clercq, & De Fruyt, 2012; Widiger, 2011; Widiger & Smith, 2008). Finally, the *Scar hypothesis* posits that personality or temperament may be altered by the experience of severe mood disturbance (Christensen & Kessing, 2006; Lewinsohn, Steinmetz, Larson, & Franklin, 1981). That is, suffering from a severe psychiatric illness, such as BD, might have a lasting effect on one's characteristic manner of thinking, feeling and relating to others (Widiger, 2011).

The proliferation of models demonstrates that there is no consensus on the relationship between categorical BD and dimensional descriptors of mood phenomena. Multiple meanings of a putative association are recognised in the literature, all of which offer plausible ways in which Cyclothymic temperament and other traits could relate to categorical BD. Importantly, it is not an aim of the current project to disentangle these different forms of relationship from one another. The present project focuses on dimensional measures, and recognises their implications for categorical diagnosis and vice versa. Dimensional measures are also seen as important in the Akiskal framework on which this study heavily relies (Akiskal & Akiskal, 2005a; Akiskal, Akiskal, Haykal, Manning, & Connor, 2005). To avoid confusion, this study adopts the definition Cyclothymic temperament, and the Temperament Evaluation of Memphis, Pisa, Paris and San Diego Auto-questionnaire Cyclothymic scale (TEMPS-Cyclothymic) was used to measure dimensions of Cyclothymic temperament. That is, the measurable extent to which Cyclothymic temperament traits were present or absent across the lifespan, was determined by a yes/no response to 17 questions. Furthermore, the literature reviewed here indicates that both Cyclothymic temperament (one-dimensional) and hypomania and depression proneness (two-dimensional) are important constructs relevant to trait vulnerability to BD. Therefore, both will be investigated here.

## 2.6 Summary of Chapter Two

The current study builds on the literature which indicates that there is a close association between Cyclothymic temperament and categorical BD. Therefore, the goal of this chapter was to introduce the concept of Cyclothymic temperament and to demonstrate the links between Cyclothymic temperament and clinical BD. To achieve this, it was necessary to first introduce the concept of temperament and the historical origins of affective temperament (2.1), then discuss the ways in which Cyclothymic temperament is associated with BD. The chapter has reviewed literature outlining the categorical (section 2.2) and ordinal perspective (section 2.3). Research indicates that there is a broader bipolar spectrum that proposes a continuum of mood severity, from normal to pathological presentations. The current study focuses on the quantitative trait perspective (section 2.4). This chapter explicitly defined Cyclothymic temperament (section 2.4.1), and presented a review of the literature associated with a two-dimensional approach to BD (section 2.4.2). The two-dimensional approach showing that trait vulnerability to BD can be usefully understood in terms of two separate trait dimensions, namely hypomania and depression proneness. The Chapter ends with a review of some alternative models that link temperament to BD (section 2.5).

# Chapter Three: Attachment Theory

## 3.0 Overview of Chapter Three

The primary rationale for investigating attachment as a mediating variable was past research suggesting that insecure attachment dimensions may play a major role in unhealthy and dissatisfying relationships (Bowlby, 1969; Bowlby, 1973; Bowlby, 2005). Although the present project is cross-sectional, it is useful to understand the core rationale from a developmental perspective. Attachment theory proposes that early caregiver responses have a significant impact on later interpersonal relationships (sections 3.1 and 3.2). Bowlby's (1973, 1977) theory describes the various attachment dimensions as a distinct but interlocking cognitive, emotional and behavioural system that drives proximity maintenance (including proximity seeking and separation protest), and the emotional need for a safe haven and secure base. A responsive, nurturing environment that allows an infant to develop strong attachments to caregivers enables the child to build positive cognitive pathways that encourage emotional and interpersonal stability. Alternatively, infants exposed to inconsistent, rejecting or unresponsive parenting styles are at risk of developing an insecure attachment (section 3.3). Beyond this classical theoretical work, there are numerous empirical studies linking insecure attachment to relationship problems and dissatisfaction in various adult populations (for a review see; Li & Chan, 2012), (section 3.4).

Empirical evidence is also reviewed that suggests the two insecure dimensions, anxious and avoidant attachment, are both associated with maladaptive internal cognitive representations of the self and others (section 3.5), dysfunctional emotional regulation strategies and increased anger, hostility and conflict (section 3.6). People with an anxious attachment style demonstrate excitatory or hypersensitive strategies that are hypothesised to stem from an overwhelming fear of rejection and abandonment. This results in excessive clinginess, over dependency, bouts of jealousy and frantic efforts to avoid abandonment.

Alternatively, evidence is offered that shows that people with an avoidant attachment style demonstrate inhibitory or deactivation of the attachment system and describe a fear of intimacy and closeness. Taken together, there is considerable evidence that anxious and avoidant attachment dimensions are important theoretical constructs that could enhance our understanding of levels of relationship satisfaction (section 3.7). Furthermore, testing insecure attachment as a plausible mechanism or process by which Cyclothymic temperament influences relationship satisfaction is important as it might inform understandings of the pathways that lead to relationship dissatisfaction in people with BD (section 3.8). Importantly, investigating insecure attachment may inform clinical practice and interventions, and could be an important mechanism of therapeutic change in people with BD (section 3.9).

## 3.1 Attachment Theory

Attachment theory aims to illuminate how past experiences between a child and his or her caregiver influence adult relationship functioning (Bowlby, 1977; Hazan & Shaver, 1987; Meyer & Pilkonis, 2001; Roisman, Collins, Sroufe, & Egeland, 2005). For Bowlby, it is this primary relationship that the child uses as a template to apply to future relationship experiences. The exposure to parental sensitivity and responsiveness in childhood may have a protective effect on future relationship outcomes in vulnerable individuals. In contrast, insensitive, low-warmth, negative and unpredictable care, together with the exposure to hostile parental interactions contribute to separation anxiety and hypersensitivity to criticism or rejection in some individuals. Fear of rejection or abandonment and insecure reactions to perceived criticism by maladaptive behaviours is theorised to be rooted in attachment (Bowlby, 1977; 1999).

## 3.2 Caregiver Responses

Ainsworth, Blehar, Waters, and Wall (1978) conducted extensive observational studies on the dyadic interactions between middle-class mothers and their infants, and

discovered vast differences between mothers' and their behaviours toward their infants, and between infant's and their behaviour towards their mothers. For instance, some mothers displayed sensitive, responsive cues to their infants whilst others remained unresponsive and distant. Similarly, some infants confidently explored their environment whilst others maintained close proximity to their caregiver and sought frequent contact. Consistency in this dyadic interaction was observed across home and laboratory conditions. The laboratory procedure, known as the 'Strange Situation,' prompted Ainsworth to come to the conclusion that an attachment bond is not essentially dyadic in nature, but a characteristic that is unique to the individual (Ainsworth, 1989).

Bowlby (1977) posited that humans have an instinctive need for social interactions that become focused on specific caregivers during the first few years of life. Ideally, the primary caregiver acts as a secure base for the developing infant to return to in times of emotional need. For instance, when physical separation becomes too great, the attachment system becomes activated and infants become hyper-vigilant to perceived threat and danger. Intense fear and separation anxiety is aroused and the infant generally exhibits behaviours consistent with distress (crying, proximity seeking, and sadness). The activation of this innate social-emotional biological system has evolutionary significance in that these intuitive behaviours are crucial for the continuation of the human species.

Separations, especially when prolonged or repeated, are hypothesized to have a double effect. On the one hand, anger is aroused, on the other, love is attenuated (Bowlby, 1973). Bowlby referred to this variable emotional response as *protest*. Protest is argued to simultaneously punish the attachment figure and discourage them from future separations, while also signalling to the attachment figure that one is emotionally distressed, frustrated, and in need of immediate care. Infants reunited with their caregivers during the protest phase have been shown to exhibit heightened anxiety over abandonment and an excessive need for

physical contact and comfort (Bowlby, 1979; Hazan & Shaver, 2004). Responsive, emotionally available caregivers quickly provide sufficient proximity that the activation of this negative emotional state decreases. These positive reunions with a caring attachment figure are expected to elicit positive emotions such as joy, love and happiness. This superseding positive emotional experience not only alleviates infant distress, but generates a level of emotional homeostasis. Once this homeostatic level is reached, the now emotionally contented child is once again free to explore their environment from a secure, loving base (Cassidy & Shaver, 2008). It is assumed that as long as the emotionally developing child experiences this "felt security", the attachment system is quiescent (Sroufe & Waters, 1977).

It is further postulated that emotionally distant, rejecting or hostile caregivers may react unfavourably to normative cries for help by withdrawing, disapproving, or reacting with anger. Infants who are predisposed to these negative environmental stressors may fail to accomplish the goal of competent, positive emotion regulation and must consider alternative strategies (Kobak & Sceery, 1988; Shaver & Mikulincer, 2007). For instance, if there appears to be no hope of re-establishing proximity after continued expressions of distress, the infant is argued to enter the phase of *despair.* Despair is characterized by passivity, inactivity and obvious sadness. Infants reunited with their caregiver after passing through the phase of despair, avoid contact and withdraw from their mothers as if they had coped with the prolonged separation by emotionally *detaching*. Consequently, an infant who suffers serious neglect and who is constantly subjected to the threat of being abandoned is prone to frequent episodes of despair. Evidence has shown that this sort of cognitive and emotional disruption leaves individuals vulnerable to normative stresses placing them at heightened risk of developing insecure attachment (Egeland & Sroufe, 1981; Mikulincer & Shaver, 2003).

### 3.3 Attachment Dimensions in Infancy

The *securely* attached infant has confident expectations of their caregiver's availability, and although visibly upset following separations, will actively seek comfort upon reunification and use the caregiver as a secure base for exploration (Ainsworth, 1978; Bretherton, 2013). As previously discussed, not all infants experience the same quality of attachment. Infants who are exposed to repeated negative environmental stressors that include emotionally distant, rejecting or hostile caregivers have an increased risk of developing an insecure attachment (Ainsworth et al., 1978).

Insecure attachments demonstrated in infancy include the *anxious* dimension where infants become thoroughly distressed by separations and are difficult to soothe upon reunion. Evidence suggests that perceived uncertainty about the primary caregiver's response, particularly in times of need, gives rise to emotional ambivalence (Ainsworth et al., 1978; Bowlby, 1969). For instance, Ainsworth et al., (1978) found that proximity seeking and bids for comfort are combined with strong expressions of anger. The anxious infant has a tendency to continuously monitor and appraise their environment for cues that signal the potential loss of care and attention from their caregiver. This preoccupation of the anxious infant with their primary caregiver is so marked that it inhibits exploration of their environment (Cassidy, 1986) and leads to uncertain cognitions regarding the availability of the attachment figure and others in close relationships (Kobak & Sceery, 1988).

Alternatively, the *avoidant* dimension, where infants have reason to expect rejection from their primary caregiver are reported to demonstrate little distress upon separation (Ainsworth et al., 1978; Bretherton, 2013). Avoidant infants have been shown to comfortably interact with strangers and upon reunification, are inclined to detach emotionally, focusing their attention toward their toys and making no attempt to maintain proximity (Ainsworth et al., 1978). These two dimensions of insecure attachment can be viewed as systematic

emotional coping methods that attempt to reduce the anxiety and distress associated with the caregiver's availability.

### 3.4 Attachment Dimensions in Adulthood

While it is important to draw on the attachment dimensions in infancy literature to emphasise the developmental significance of insecure attachment across the lifespan (Waters, Merrick, Treboux, Crowell, & Albersheim, 2000), the current project focuses on adult attachment. Much of the pioneering work on adult attachment dimensions began with Hazan and Shaver (1987). These investigators extended Ainsworth and colleagues' (1978) description of the behavioural and emotional characteristics of insecure and securely attached infants and explored the possibility that the same attachment dimensions could be applied to adult romantic love. Their theory suggests that early attachment experiences, at least in part, influence how adults behave in close relationships (Brennan & Shaver, 1995; Onishi, Gjerde, & Block, 2001; Reynaud et al., 2012; Sanford, 1997). Specifically, the attachment processes experienced in infancy are proposed to influence both cognitive and emotional responses in adult close relationships (Brennan et al., 1998; Collins & Read, 1990; Feeney, 1999b; Feeney & Noller, 1990; Hazan & Shaver, 1987; Kobak & Hazan, 1991; Simpson, 1990; Simpson, Collins, Tran, & Haydon, 2007). Sections 3.5 and 3.6 offer a detailed review of evidence suggesting that maladaptive cognitive, and emotional regulation strategies are found in adults with an insecure attachment.

Hazan and Shaver (1987) went on to develop a questionnaire to assess romantic attachment. The questionnaire contains a variety of questions related to respondents' most important relationship (current or past). Based on responses to 56 agree-disagree statements, 620 participants defined themselves as either secure, anxious, or avoidant attached. Over half of the participants (56%) described themselves as secure, 25% described themselves as avoidant and 19% described themselves as anxious. The questionnaire also included sections

related to participants' attachment history and their childhood relationships with their parents, as well as the parents' relationship with each other. Adult attachment was found to be strongly related to participants' early social-emotional experiences. For instance, secure adults reported warmer relationships with both parents and an affectionate, caring and happy relationship between their two parents. They described their parents as respectful, understanding, accepting, non-critical and non-rejecting. In contrast, anxious and avoidant adults reported an increase in negative descriptors, such as critical, cold, rejecting and disinterested parents (Hazan & Shaver, 1987).

### 3.5 Attachment Dimensions and Cognitive Representations of the Self and Others

Attachment theory asserts that early repeated positive or negative interactions with attachment figures influence infants' developing cognitive representations of self and others. Infants learn what to expect from their caregiver, draw on these experiences and adjust their behaviour accordingly (Feeney & Noller, 1990; Fraley & Davis, 1997; Hazan & Shaver, 1987; Wearden, Peters, Berry, Barrowdough, & Liversidge, 2008). Bowlby (1979, 1999) described these cognitive representations as *internal working models* and claimed that these working models help shape personality development, emotion regulation strategies and the ability to form satisfying relationships across the lifespan (Hazan & Shaver, 1987, 2004).

Bartholomew and Horowitz (1991) incorporated Bowlby's idea about positive and negative models of self and others into a two-dimensional model which they argued gives rise to a typology of four types (three insecure types and one secure type). The three insecure types are described as *preoccupied, fearful and dismissing*. The preoccupied type corresponds conceptually to Hazan and Shaver's anxious dimension, while the fearful and dismissing type partially correspond to the avoidant dimension (Hazan & Shaver, 1987). All are assumed to develop out of repeated negative interactions with primary attachment figures. Individuals identified with an anxious attachment predominantly hold negative internal working model of

self, combined with a positive view of others. This means they are chronically sensitive to rejection and abandonment in their relationships and are inclined to feel unlovable by partners, view themselves as worthless, and have a tendency to emphasize personal deficiencies and imperfections. This negative self-view leads the person to strive for the affection, acceptance and love of others (Bartholomew & Horowitz, 1991; Bretherton & Munholland, 2008; Klohnen & John, 1998; Mikulincer, 1998a; Mikulincer & Florian, 1998). Research has generally shown that individuals with avoidant attachment also hold a negative self-view, although this is combined with a negative view of others (Bartholomew & Horowitz, 1991; Collins & Read, 1990; Hazan & Shaver, 1987). For instance, avoidant individuals develop and internalize a model of self as worthless and incompetent with an expectation that others are unreliable and rejecting. The avoidance of close romantic encounters with others is theorised to act as a form of defence protecting the individual against anticipated rejection (Bartholomew & Horowitz, 1991).

Evidence has shown that securely attached individuals consistently seem to have a positive view of self and a positive view of others. They report a higher sense of self-worth, have greater social confidence and they have high regard for others, as implied by their high scores on measures such as altruism and trust (Collins & Read, 1990). For the securely attached individual, this perceived relationship 'compatibility' between the positive view of self (from the person's own standpoint) and the positive view of others, contributes to greater mutual constructive communication (Domingue & Mollen, 2009) and high levels of commitment and relationship satisfaction (Holmes & Johnson, 2009). However, even in securely attached people, when a perceived discrepancy occurs within the realms of a close relationship, it is hypothesised that individuals can become susceptible to negative emotional consequences, which in turn has a negative, destructive effect on dyadic relationships (Boldero et al., 2009; Robins & Boldero, 2003).

### 3.6 Attachment Dimensions and Emotion Regulation Strategies

An important focus of attachment theory is the ability to effectively regulate distress and negative emotion (Cassidy, 1994; Guerrero et al., 2009; Karreman & Vingerhoets, 2012; Sheinbaum et al., 2015), particularly in response to life stressors (Mikulincer & Florian, 1998). People scoring high on measures of secure attachment have been found to successfully regulate and manage negative emotion without fear of losing control or becoming emotionally overwhelmed (Simpson et al., 2007). There is also evidence that securely attached individuals remain relatively unperturbed during times of stress, recover faster from episodes of distress, and experience longer periods of positive emotion such as excitement, elation, joy and happiness (Simpson, 1990; Simpson et al., 2007; Simpson, Rholes, & Phillips, 1996).

In contrast, people scoring high on measures of insecure attachment tend to cope with emotional distress by hyper-activation (maladaptive up-regulation) and/or deactivation (maladaptive down-regulation) of the attachment system (Shaver & Mikulincer, 2007). Both of these emotional regulation strategies result in dysfunctional insecure attachments and a propensity toward experiencing intense negative emotions such as destructive outbursts of anger, fear, jealousy, irritability, hostility and distress. A recent meta-analytic review found that people who score high on the anxious attachment dimension tend to adopt a hyper-activation strategy that, as previously mentioned, is chronically hypersensitive to rejection cues and abandonment (Li & Chan, 2012). Once activated, this initiates proximity-seeking that endeavours to achieve felt security. These excitatory (approach) related behaviours may include clinging, controlling and coercive behaviours, together with cognitive and behavioural efforts to establish physical contact and a sense of merger and overdependence on partners for protection (Fraley & Shaver, 2000; Shaver & Mikulincer, 2007). Alternatively, people who score high on attachment avoidance tend to rely on inhibitory or deactivation strategies (negative withdrawal responses). This deactivation of the attachment system leads to the

suppression of unpleasant emotions and detachment from intimate relationships. The denial of negative emotions contributes to unremitting relationship difficulties (Mikulincer & Shaver, 2008).

### 3.7 Attachment Dimensions and Close Relationships

As predicted by attachment theory, insecure attachment is associated with considerable relationship disruption and dissatisfaction which persists well into adulthood (Ainsworth, 1978; Bowlby, 1999, 2005; Bretherton, 2013; Campbell, 2011; Feeney, 1999a; Feeney, 1999b; Feeney & Noller, 1990; Hazan & Shaver, 1987, 2004; Sheinbaum et al., 2015; Simpson et al. 2015). The recurrent failure to obtain support from attachment figures and to sustain a sense of security results in reliance on secondary attachment strategies (hyper-activation or deactivation). This interferes with the acquisition of social skills and can lead to serious problems in interpersonal relationships (Mikulincer & Shaver, 2012). For instance, people who score high on attachment anxiety are reported to find it easy to fall in love, however, these feelings seem to wax and wane over the course of the relationship (Hazan & Shaver, 1987, 2004). Hazan and Shaver (1987) found that people with an anxious attachment often felt misunderstood by their partners, lacked confidence, felt under-appreciated, and found others less capable than themselves to commit to a relationship. A study that investigated how the perceptions of dating partners change after discussing a major problem found that people with an anxious attachment perceived their partner and relationship negatively in terms of the love and commitment, mutual respect, and openness and supportiveness in the relationship (Simpson et al., 1996). Subsequently, people with an anxious attachment are unlikely to be involved in a close romantic relationship, experience high levels of loneliness and suffer from the most unsatisfying relationships of all attachment dimensions (Bartholomew & Horowitz, 1991; Li & Chan, 2012).

Conflict escalation is also frequently reported in people with an anxious attachment (Campbell, Simpson, Boldry, & Kashy, 2005; Li & Chan, 2012). Conflict with romantic partners represents a major threat to people with an anxious attachment due to their entrenched fears of rejection and abandonment. An inability to cope with the stresses associated with relationship dysfunction gives rise to an increase in negative emotions such as anger, sadness and fear (Creasey & Hesson-McInnis, 2001). Mikulincer (1998b) found that dysfunctional anger tends to overwhelm individuals with an anxious attachment. Their proneness to display intense intimacy anger, verbal and physical aggression (directed towards their partner), jealousy and hostile reactions may result from their basic belief that significant others are unavailable and insensitive to their needs (Dutton, Saunders, Starzomski, & Bartholomew, 1994; McKee, Roring, Winterowd, & Porras, 2012). For people with an anxious attachment, one inappropriate outburst of anger can destroy a relationship forever, instigating what they fear the most, losing their partner and the relationship (Lopes, Salovey, Cote, & Beers, 2005), in a self-fulfilling prophecy (Downey, Freitas, Michaelis, & Khouri, 1998).

People scoring high in attachment avoidance have also been found to experience intense hostility in close relationships (Li & Chan, 2012; Mikulincer, Shaver, Bar-On, & Ein-Dor, 2010). However, they are also proposed to suppress anger related emotions, minimise closeness and utilise autonomous coping mechanisms, regardless of the deleterious effects on a relationship (Collins & Read, 1990; Hazan & Shaver, 1987, 2004; Li & Chan, 2012; Mikulincer & Shaver, 2007). After discussing a major problem, people with attachment avoidance were rated as unsupportive, hostile, cold and rejecting by their partners (Simpson et al., 1996).

There is evidence that secure attachment supports functional anger. That is, people with secure attachment generally scored lower in anger proneness, endorsed more

constructive anger goals, and reported more adaptive anger responses than insecurely attached individuals (Mikulincer, 1998b). For instance, securely attached people have been found to rationalise disagreements rather than escalate the issue by uncontrollable urges to punish and harm their partner (Mikulincer, 1998b). The ability to sustain emotional control and effectively discuss conflicts and disagreements is likely to result in effective support seeking and care giving interactions. Secure attachment is consistently linked with reports of increased relationship satisfaction (Collins & Feeney, 2000; Eğeci & Gençöz, 2006; Feeney, 1999a). Hazan and Shaver (1987) discovered that securely attached adults regarded their romantic close relationships as happy, friendly and trusting, and despite their partner's faults they experienced long and satisfying relationships. In a sample of 620 (of these 620 replies, 205 were from men and 415 were from woman), the duration of the secure participants' relationships averaged 10.02 years, compared with 4.86 years for the anxious attached participants and 5.97 years for the avoidant attached participants. Forty-two percent of participants were married at the time of the survey, 28% were divorced or widowed, 9% were "living with a lover" and 31% were dating. Only 6% of the securely attached participants had been divorced, compared with 10% of the participants with an anxious attachment and 12% with an avoidant attachment.

For the present project it is important to note that whilst attachment dimensions are purported to remain stable across significant portions of the lifespan, it is important to recognise that attachment dimensions are assumed to remain open to revision in light of more proximate life experiences or ongoing experiences that people have in their relationships (Waters et al., 2000). For instance, acute life events such as serious illness (Nissen, 2016), depression (Bifulco, Moran, Ball, & Bernazzani, 2002), heightened stress (Simpson & Rholes, 2017), chronic conflict (Feeney & Karantzas, 2017), a history of failed relationships (Hadden et al., 2014), a recent relationship break-up (Zimmermann & Celik, 2015), a history of violent

offending (Ogilvie, Newman, Todd, & Peck, 2014) or loss of a loved one (Meier, Carr, Currier, & Neimeyer, 2013) may impact how people rate their attachment dimension and quality of adult close relationships. As such, understanding differences in adult attachment requires attention not only to early life experiences, but perhaps more importantly to ongoing proximal experiences (Fraley, Roisman, Booth-LaForce, Owen, & Holland, 2013). Research on the mechanisms through which life experience in adulthood leads to change in attachment dimensions deserves high priority in current attachment research (Waters et al., 2000).

### 3.8 Attachment Dimensions as a Mediator

As previously mentioned in section 1.1, this is not the first study to make assumptions about the nature of adult attachment (Bifulco et al., 2006; Byun, Brumariu, & Lyons-Ruth, 2016; Cohen et al., 2017; Hinnen, Sanderman, & Sprangers, 2009; Hocking et al., 2016; Jarnecke & South, 2013; London, Lilly, & Pittman, 2015; Pilton et al., 2016; Rholes et al., 2016; Sheinbaum et al., 2015; Sutton, Simons, Wickrama, & Futris, 2014; Tasca et al., 2013). For instance, adult insecure attachment has been found to mediate the association between childhood memories and adult functioning (Hinnen, Sanderman, & Sprangers, 2009). Bifulco et al. (2006) examined in a group of 154 community women who were at risk of affective disorder whether adult insecure attachment mediated the relationship between childhood neglect and the actual occurrence of affective disorders. These authors showed that childhood neglect and abuse was associated with an increased risk for developing an affective disorder and this association became non-significant when insecure attachment was taken into account. This study suggests that insecure attachment mediates the association between adverse childhood experiences and the risk of developing an affective disorder. In terms of vulnerability to other psychiatric disorders, Sheinbaum et al. (2015) found the association between poor childhood care and schizophrenia-spectrum phenomenology was mediated by insecure attachment. A significant indirect effect of insecure attachment on the relationship

between exposure to community violence and post-traumatic stress symptoms was found by London, Lilly & Pittman, (2015).More recently, Cohen et al. (2017) investigated the association between childhood maltreatment and adult personality dysfunction in a sample of 72 psychiatric inpatients. They found that the association between childhood maltreatment and adult personality dysfunction was mediated by adult attachment. Specifically, anxious attachment was found to be a significant mediator of the effect of childhood trauma on self-control, identity integration & relational domains.

The results described above suggest that childhood trauma impacts on a broad range of personality domains and does so in large through the pathway of insecure attachment. These findings also seem to support the idea that early toxic family environments, which impede a child's basic needs for secure attachment, might be a key factor in the development of adult relationship distress in people vulnerable to BD. While it is important to draw on this literature to emphasise the importance of insecure attachment as a mediator, the studies described above by no means provide evidence that insecure attachment acts as a mediator between Cyclothymic temperament and relationship satisfaction. Nevertheless, they do imply that the exploration of insecure attachment as a mechanism could be an important step along the path to identifying why people with vulnerability to BD experience relationship dissatisfaction.

### 3.9 Attachment is an important target for investigation because it is potentially modifiable in Therapy

Although as discussed, attachment refers to something laid down primarily in early life, it carries through into adulthood as a potentially modifiable feature of the person (Mason, Platts, & Tyson, 2005; Simard, Moss, & Pascuzzo, 2011; Stanojevic & Nedeljkovic, 2012). The constructs of attachment and early maladaptive schemas are thought to have common elements in that they refer to the same experiences and perhaps the stored memory

of these experiences (Bosmans et al., 2010; Roelofs, Lee, Ruijten, & Lobbestael, 2011; Roelofs, Onckels, & Muris, 2013).

Specifically, attachment in adulthood is understood as being potentially malleable through therapies focusing on attachment schema (Diamond, Russon, & Levy, 2016; Diamond, 2014). Indeed, adult attachment theory is increasingly being referenced as a framework by which therapists may conceptualize and facilitate change in intrapersonal and interpersonal relationships (Bay-Smadja & Rahioui, 2015; Bosmans, 2016; Dalgleish et al., 2015; Diamond et al., 2016; Greenberg et al., 2014; Moser et al., 2016; Zeanah & Gleason, 2015). Consequently, the possibility that adult attachment might be involved in the relationship between Cyclothymic temperament and relationship satisfaction is potentially clinically significant.

As discussed below, outside serious mental illness, a wide range of evidence-supported psychotherapies have mined the explanatory importance of attachment and schema laid down in early childhood. For instance, recent studies suggest that specific therapies can be strengthened by giving a patient an opportunity to talk about the past (Diamond, Russon, & Levy, 2016; Diamond, 2014; Waters, Merrick, Treboux, Crowell, & Albersheim, 2000). For example, Attachment Based Family Therapy (ABFT) is an empirically supported treatment designed to capitalize on the innate, biological desire for meaningful and secure relationships (Diamond et al., 2016; Diamond, 2014). ABFT focuses on family factors, such as parental rejection and criticism, low parental warmth, and adolescent-parent conflict. The treatment moves through a progression of tasks designed to systematically resolve and discuss attachment ruptures that have damaged the trust between individuals and the parent and undermined the relational bond (Diamond et al., 2016). Several outcome studies have demonstrated the efficacy of ABFT in improving attachment security in depressed and suicidal adolescents (Diamond, 2014; Shpigel, Diamond, & Diamond, 2012).

Emotionally- Focused Couples Therapy (EFT) is another empirically validated treatment with a foundation in attachment theory (Dalgleish et al., 2015; Moser et al., 2016). The process of change in EFT provides partners with the opportunity to experientially explore and disclose attachment needs and the chance to learn that others can respond to these attachment needs in a more emotionally supportive and attuned manner than they experienced in the past. Recent findings suggest that couples self-reported decreases in attachment anxiety and avoidance over the course of therapy were significantly associated with increases in relationship satisfaction (Moser et al., 2016). Research also suggests that focusing on both attachment bonds and changing maladaptive schemas could be beneficial in the treatment of symptoms of depression (Roelofs et al., 2011) and pychopathological symptoms in adolescents (Roelofs et al., 2013).

While the focus here is a more 'developmental time-frame', with Cyclothymic temperament impacting on adult attachment, which in turn influences relationship satisfaction, the findings suggest that psychological therapies with adults might benefit from focussing on attachment-related cognitive schemas as one potential target of therapeutic change. Thus, the application of attachment theory in clinical practice appears to offer a rich and clinically meaningful framework from which to better understand the specific psychological mechanisms that underpin relationship outcomes. The current study, using a cross-sectional investigation of a proposed attachment mediator between vulnerability to BD and relationship satisfaction sought to test how attachment constructs might relate to BD.

### 3.10 Summary of Chapter Three

Attachment theory emphasises the development of attachment dimensions in early life. The attachment variable in this study, however, was adult attachment, understood as a proximal variable indexing both early life experiences and later events (including potentially early symptoms of disorder). Consequently, the present study aimed to investigate insecure

attachment as a potential mechanism through which vulnerability to BD influences relationship satisfaction. Measuring the potential mediating role of a variable (a) brings with it the rich psychological theory of attachment, but (b) also is proximal to the person's adult experience and importantly, open to therapeutic mediation. Chapter 3 introduced attachment dimensions, and provided a detailed account of how different caregiver responses contribute to development of different attachment dimensions in infancy and early childhood (sections 3.1 and 3.2). Then, the various recognised attachment dimensions were discussed, paying specific attention to the two dimensions of insecure attachment, namely, anxious attachment and avoidant attachment found in both infancy (section 3.3) and adulthood (section 3.4). Following this, a review of studies that investigated attachment dimensions and the influence of internal schema related to self and others (section 3.5), and emotion regulation strategies (section 3.6) were presented. The literature linking insecure attachment to problematic relationship outcomes was also reviewed (section 3.7). The findings suggest that people with an insecure attachment experience more difficulties in close dyadic relationships than people with a secure attachment. Intense hostility, dysfunctional anger and relationship dissatisfaction are some of the relationship problems that are experienced by people with an insecure attachment. To strengthen the assumption that insecure attachment potentially acts as a mediator between Cyclothymic temperament and relationship satisfaction, some distinct studies are reviewed that evaluate insecure attachment as a mechanism of therapeutic change (section 3.8). Finally, several evidence based psychotherapies that focus on improving attachment bonds and attachment schema were discussed (section 3.9). Recent results suggest support for targeting insecure attachment as a way to enhance attachment relationships in depressed adolescents.

Accordingly, to help understand the pathways by which Cyclothymic temperament contributes to relationship (dis)satisfaction, the theoretically rich, well-researched construct of insecure attachment seems to warrant consideration as a hypothetical mediator.

# Chapter Four: The Bipolar Spectrum and insecure attachment dimensions

## 4.0 Overview of Chapter Four

Informed and driven by attachment theory, this study seeks to explore whether insecure attachment is one mechanism by which Cyclothymic temperament affects relationship satisfaction. The exploration of insecure attachment as a mediating variable is important in that it not only demonstrates close links with relationship dissatisfaction, but may offer a plausible explanation as to why people with vulnerability to BD experience greater relationship dissatisfaction. In Chapter 4, the introductory section (section 4.1) is perhaps the most relevant to the current project and offers a synthesis of literature to support links between the bipolar spectrum and insecure attachment dimensions. While there is a growing interest in BD and insecure attachment, the study of insecure attachment as a process or mechanism which relationship change might occur in people vulnerable to BD is an area in need of particular attention. Therefore, some general background information is also offered to draw attention to the bipolar spectrum across the lifespan, from childhood to adolescence and early adulthood (section 4.2). The identification of Cyclothymic temperament in childhood in those with a history of depression is particularly important, as a potential indicator for progression to full-blown BD. Prevalence estimates of Cyclothymic temperament and clinical BD among the general population (section 4.3), and age of onset (section 4.4) highlights the importance of recognising clinical BD in adolescence.

## 4.1 The Bipolar Spectrum and Insecure Attachment Dimensions

Children of parents affected by BD are not only genetically predisposed to the conditions themselves (Chiaroni, Hantouche, Gouvernet, Azorin, & Akiskal, 2005; Kelsoe, 2003), but parental disorder may also increase the risk of the disorder through an unpredictable caregiving environment, which in turn may interfere with the offspring's development of an insecure attachment (Kokcu et al., 2010). This may further interfere with

and compromise their future relationships (Greenberg et al., 2014). Thus, in terms of understanding how people vulnerable to BD might operate in adult relationships, one might speculate that variables such as attachment are highly relevant.

### 4.1.1 Clinical BD and insecure attachment dimensions

There is growing empirical interest in links between BD and attachment (primarily the insecure dimensions) (Harnic et al., 2014; Kokcu, Kesebir, & Dereboy, 2010; Marazziti et al., 2007; Morriss, van der Gucht, Lancaster, & Bentall, 2009). For example, in a recent study Morriss et al. (2009) administered the Attachment Styles Questionnaire to a sample of 107 patients with BD and 41 matched controls. Compared with controls, the most prominent attachment dimension in patients with BD was the anxious attachment dimension. More detailed analyses suggesting participants with a history of bipolar depression reported higher levels of anxious attachment, whilst those with a history of mania were more likely to endorse the secure and attachment avoidant dimensions. Marazziti et al. (2007) administered the Experiences in Close Relationships (ECR) questionnaire to 62 patients with BD and found the anxious attachment dimension was the most prevalent among patients with both BD-I ($n$ = 31) and BD-II ($n$ = 31). Healthy controls reported higher levels of secure attachment in both of the studies of Morriss et al. (2009) and Marazziti et al. (2007).

### *4.1.2 Cyclothymic temperament and insecure attachment dimensions*

An important feature of Cyclothymic temperament is interpersonal sensitivity, that is, people with Cyclothymic temperament have a tendency to perceive themselves as not fully capable of managing relationships with others (Akiskal et al., 1977; Akiskal et al., 1979). This tendency, strengthened in part by low self-esteem, results in the individual being sensitive to the expression of rejection, judgement and criticism of others (Akiskal, 1992a; Akiskal et al., 1979; Akiskal et al., 1998; Placidi, Signoretta, et al., 1998). Furthermore, “falling in and out

of love" and the relentless pursuit of romantic opportunities are also characteristics of Cyclothymic temperament (Akiskal et al., 1977; Akiskal & Akiskal, 2005b).

These findings seem to suggest that Cyclothymic temperament may be associated with insecure attachment, which in turn may affect relationship satisfaction. Although empirical research investigating links between Cyclothymic temperament and attachment dimensions is limited, current evidence broadly suggests that anxious and avoidant attachment is prominent in people with Cyclothymic temperament (Lang, Papp, Gonda, Dome & Rihmer., 2016). In this recent study, affective temperament and adult attachment dimensions were assessed in 1469 Hungarian university students. The findings showed that correlations were especially robust between Cyclothymic temperament and the anxious attachment dimension (Lang et al., 2016).

A small number of studies also suggest that Cyclothymic temperament is associated with an insecure attachment in people with BD (Harnic et al., 2014; Kokcu & Kesebir, 2010) and Cyclothymic temperament in people with personality disorders (MacDonald, Berlow, & Thomas, 2013). Kokcu and Kesebir. (2010) administered the Adult Attachment Scale (AAS) and the TEMPS-A to 44 patients with BD and found positive correlations between high scores on the TEMPS-A Cyclothymic scale and the avoidant attachment dimension. More recently, a preliminary study examined associations between the TEMPS-A cyclothymic scale and the Experiences in Close Relationships scale (ECR-R) in a sample of 90 people with BD (Harnic et al., 2014). Fifty-one percent of patients had a diagnosis of BD-I, 33.3% had BD-II, and 15.6% were diagnosed with cyclothymic disorder (Harnic et al., 2014). The findings showed that the presence of Cyclothymic temperament in people with BD was predominantly associated with the anxious attachment dimension. Similarly, Macdonald et al., (2013) administered the TEMPS-Cyclothymic scale and ECR-R to a sample of 357 psychiatric outpatients and also found robust correlations between Cyclothymic temperament and the

anxious attachment dimension. In line with Harnic et al. (2014) and Macdonald et al. (2013), the current study also utilised the ECR-R to measure anxious and avoidant attachment dimensions.

### 4.1.3 A related body of research

Despite the growing empirical interest in links between the bipolar spectrum and insecure attachment dimensions, there still remains relatively little literature exploring the bipolar spectrum and attachment dimensions. Therefore, a related body of research that investigates attachment dimensions in BPD (see definition of BPD section 2.3.2, page. 15) will be briefly considered. This literature is of potential importance as it not only helps understand associations between mood instability and insecure attachment better, but because of the considerable overlap between BPD, the bipolar spectrum, and Cyclothymic temperament (Benazzi, 2006a, 2008; Perugi, 2005; Perugi et al., 2013; Perugi et al., 2011; Perugi et al., 2003; Smith et al., 2005). There is evidence to suggest that BPD could be considered part of a broader bipolar spectrum (Coulston et al., 2012; MacKinnon & Pies, 2006). Furthermore, there is emerging evidence that BD and BPD may share aetiology in early childhood trauma and abuse (Coulston et al., 2012).

Relationship difficulties, increased physical violence and reduced mutual communication are common features in people with BPD (Daley, Burge, & Hammen, 2000; Selby, Braithwaite, Joiner, & Fincham, 2008), as are frequent breakups and reconciliations, which over time, often result in the termination of the relationship (Bouchard, Sabourin, Lussier, & Villeneuve, 2009). Sable (1997) found that people diagnosed with BPD exhibit an intense attachment insecurity manifesting as a tendency to vacillate between a desire for intimacy, and concern about dependency and rejection. Accumulating evidence points to an anxious attachment (Agrawal, Gunderson, Holmes, & Lyons-Ruth, 2004; Bouchard et al., 2009; Fonagy, Target, & Gergely, 2000; Levy, 2005; Levy, Beeney, & Temes, 2011; Levy,

Meehan, Weber, Reynoso, & Clarkin, 2005; Scott, Levy, & Pincus, 2009) and severe relationship disruption as the core features of BPD (Daley et al., 2000; Selby et al., 2008; Steele & Siever, 2010).

Finally, it is useful to consider evidence for other features of vulnerability and hypersensitivity to rejection and separation that have also been linked to the bipolar spectrum. While not specifically conceptualised as an attachment dimension, "separation anxiety", characterised by a persistent, excessive, and developmentally inappropriate fear of separation from major attachment figures (usually parents), is a childhood clinical disorder commonly found in children and adolescents across the bipolar spectrum, ranging from those with clinical BD (Lewinsohn et al., 2000; West, Schenkel, & Pavuluri, 2008) to those with Cyclothymic temperament (Signoretta, Maremmani, Liguori, Perugi, & Akiskal, 2005). Similarly, evidence suggests that separation anxiety is not just restricted to childhood and is also marked in adults with BD (Benazzi, 2000a, 2000b, 2000c; Perugi et al., 2012; Pini et al., 2005; Pini et al., 2010). Furthermore, "interpersonal rejection sensitivity" which is characterized by significant functional impairment, unstable relationships, reaction to rebuff or criticism by maladaptive behaviours and avoidance of relationships for fear of rejection, is a personality characteristic that is representative of a longstanding atypical depression which can be linked to both unipolar and bipolar diagnoses (Benazzi, 2000a). These additional studies are included in order to provide some further evidence consistent with the assumption that an insecure attachment mediates the relationship between Cyclothymic temperament and relationship satisfaction.

### 4.2 The Bipolar Spectrum in Childhood, Adolescence and Early Adulthood

**Categorical BD.** BD usually first occurs between the ages of 15 – 30 years (see section 4.4). However, BD can affect people of all ages, with some people experiencing their first symptoms during childhood (Youngstrom, Birmaher, & Findling, 2008). For instance,

Kraepelin (1921) found that 0.4% of his patients had displayed manic or hypomanic features before the age of 10. Other studies also indicate that bipolar symptoms can be detected in early childhood. For instance, in a large-scale epidemiological study of BD in children and adolescents, the reported mean age of onset was 11 years (Lewinsohn et al., 1995; Lewinsohn et al., 2003). For most of these participants (18 bipolar cases) the condition first started with either cyclothymic features or a major or minor depressive episode (Lewinsohn et al., 1995). More recently, a study of 52 youth with categorical cyclothymia (aged 5-18 years) found that 73% of the sample had symptom onset prior to the age of 10 (mean age: 6.5 years) and symptoms similarly started with a depressive episode (Van Meter et al., 2011). In contrast, in a review of 89 prepubertal and young adolescents (aged 7-16 years) diagnosed with mania (mania in this study was defined as the presence of mood elation and/or grandiosity) the mean age of onset of first manic episode was 7 years (Craney & Geller, 2003).

The methods used to measure mania in this age group are questionable. Thus, despite the recognition that onset of BD can occur in childhood and that it is desirable to detect onset promptly, there is significant controversy over the validity of bipolar diagnosis in children (Duffy, 2007; Duffy & Carlson, 2013; Hirneth, Hazell, Hanstock, & Lewin, 2015). For instance, in addition to the periods of mania, 87.1 % of children with prepubertal and early adolescent BD are reported to experience coexisting irritability and mood instability, and unlike in adult BD, 77.4% presented with a chronic, mixed mania, psychotic, continuous (ultradian) rapid cycling picture (Craney & Geller, 2003; Geller et al., 2000; Geller, Craney, et al., 2002). A further study has defined mania in children by the presence of severe agitation and behavioural dysregulation such as intense irritability, rage, explosiveness, and destructiveness (Biederman, Faraone, Wozniak, & Monuteaux, 2000).

Features such as irritability, explosive anger, mood elation and grandiosity could potentially be observable early warning signs that are indicative of early onset BD (Malhi,

Bargh, Coulston, Das, & Berk, 2014). However, severe irritability is suggestive of many childhood syndromes. These include disruptive mood dysregulation disorder, oppositional defiant disorder, attention-deficit/hyperactivity disorder (ADHD) and intermittent explosive disorder (DSM-5: APA, 2013). However, the central feature differentiating childhood BD from these other syndromes is the chronic and episodic nature of the condition (Singh, 2008). Another central differentiating feature is the presence of symptoms that occur exclusively in (hypo) mania like grandiosity, elated mood, flight of ideas, hypersexuality and increased goal directed activity (Singh, 2008). Furthermore, when compared with both prepubertal and early adolescents with ADHD and community controls, a recent study found that prepubertal and early adolescents with BD had significantly greater impairment on items that assessed maternal-child warmth, maternal-child and paternal-child tension, and peer relationships (Geller et al., 2000). Hypersexuality was also found to be a manifestation of child mania in this sample (Geller et al., 2000). Onset of BD in childhood suggests poorer course and outcome than BD manifesting in adulthood (Geller, Craney, et al., 2002; Geller, Zimerman, et al., 2002; Hauser et al., 2007). Early onset of BD is also associated with poorer response to mood stabilisers, more time in depressive episodes, increased risk of drug abuse and increased rate of suicide attempts (Coryell, Fiedorowicz, Leon, Endicott, & Keller, 2013; Lewinsohn et al., 2000; Tozzi et al., 2011).

**Cyclothymic temperament.** There is an absence of literature concerning the existence of Cyclothymic temperament in children. However, a prospective study conducted by Kochman et al. (2005) using the TEMPS-Cyclothymic scale, found that children with depression and higher scores on Cyclothymic temperament had levels of impairment and comorbidity that were comparable to diagnosable BD. These researchers identified the existence of Cyclothymic temperament in 80 children and adolescents, aged 7-17 years with a history of major depressive disorder (identified as high risk for developing BD). Findings

revealed that those with Cyclothymic temperament and symptoms of depression displayed a special form of BD, characterised by rapid mood shifts, psychotic features, irritability, explosive anger and increased aggressive behaviour, suicidality and emotional sensitivity. These children were also more likely to be taking an antidepressant than depressed children without Cyclothymic temperament (Kochman et al., 2005). Kochman and colleagues (2005) reinterviewed participants 24 months later and discovered 63.8% of the children with antecedents of depression and Cyclothymic temperament went on to experience at least one hypomanic episode. In contrast, only 15.2% of children without Cyclothymic temperament experienced a hypomanic episode.

Kochman et al.'s study (2005) is important as it suggests that the risk of converting to BD-II is greater in children with Cyclothymic temperament and a history of depression. Histories of emotional and behavioural problems that begin in childhood and continue into adolescence are common in adolescents with cyclothymic features (Signoretta et al., 2005; Van Meter et al., 2011; Van Meter & Youngstrom, 2012). In a four year follow up study, Birmaher and colleagues (2009; 2006) found that 38% of children/adolescents (aged 7-17 years) with a history of subsyndromal (and, less frequently syndromal) depressive and rapid mood changes converted to BD-I or BD-II (Birmaher et al., 2009). In the Oregon Adolescent Depression Project (OADP), a randomly selected, community sample of adolescents (aged 14-18 years) were followed and by their early 20's, 2.1% met diagnostic for BD-I or BD-II and a further 5.3% had subsyndromal bipolar spectrum features (Lewinsohn et al., 2000). Of the 17 cases of adolescent BD, over half (53%) exhibited a chronic/recurrent course (Lewinsohn et al., 2000). More recently, a study found that among a sample of 201 adolescents aged 18-24 with BD-II or cyclothymia, the rates of conversion to a more severe bipolar diagnosis was high. For instance, of 57 participants with cyclothymia at project outset, 24 (42.1%) converted to a BD-II diagnosis over 4.5 years of follow up, whereas 6

(10.5%) converted to a BD-I diagnosis. Of 144 participants with BD-II at project outset, 25 (17.4%) converted to a BD-I diagnosis over the same follow up period (Alloy et al., 2012). Therefore, it is important to identify and treat children and adolescents with cyclothymic mood instability and to monitor their continuing course (Paaren et al., 2014).

### 4.3 The Bipolar Spectrum: Prevalence

This section reviews the various types of data that lend to prevalence estimates for different aspects of the bipolar spectrum. First, data on categorical BD are reviewed.

**Categorical BD-I.** Mania is reported to affect approximately 1-2% of the general population (Kessler, Rubinow, Holmes, Abelson, & Zhao, 1997; Merikangas et al., 2012; Merikangas et al., 2011). Other nationally representative studies in the USA have reported a range of up to 3% for mania (Goldstein et al., 2005; Hoertel, Le Strat, Angst, & Dubertret, 2013).

**Categorical BD-II.** Prevalence of BD-II has been estimated in a number of populations (Angst, 1998; Faravelli et al., 2006; Merikangas et al., 2011; Regeer et al., 2006; Szadoczky, Papp, Vitrai, Rihmer, & Furedi, 1998; Wicki & Angst, 1991). For instance, two studies, one based on community participants in the Canton of Zurich, Switzerland (Angst, 1998) and another based in Hungary (Szadoczky et al., 1998) have reported rates of hypomania up to 5.5%. A large epidemiological study undertaken in the USA found a community prevalence of hypomania of almost 4% (Hirschfeld, Calabrese, et al., 2003). Similarly, in a 28-30 year old cohort, again in the Canton of Zurich, Switzerland, a rate of approximately 4% was also found (Wicki & Angst, 1991). Subsequently, a study of older adolescents (aged 14 through to 18 years) in Oregon, USA, found 5.7% met criteria for hypomania (Lewinsohn et al., 1995).

An Italian community study found an overwhelming 17.7% of participants met diagnostic criteria for hypomania (Mangelli, Benazzi, & Fava, 2005). Mangelli and

colleagues noted that they may have studied a biased sample (selection bias that overrepresented people with mental health problems) or that the measure they used the MDQ may over-diagnose BD (see also Zimmerman & Galione, 2011). Hirschfeld et al. (2003) also used the MDQ and found a much lower prevalence (3.7%). In a sample of 18,252 respondents derived from five data collection sites of the NIMH Epidemiological Catchment Area Program (Baltimore, MD; Durham, NC; Los Angeles, CA; New Haven, CT; and St Louis, MO) clinicians used the broader spectrum approach to look at the prevalence of the bipolar spectrum in the community and found a prevalence rate of 6.4% for the US population (Judd & Akiskal, 2003). A 20-year prospective community cohort of 4,547 young adults found a much higher rate (23.7%) of which nearly 11% constituted categorical BD, and 13% represented subclinical mood expressions respectively (Angst et al., 2003). A French multi-centre EPIDEP study conducted in a cohort of 537 patients with major depressive episodes (MDE, DSM-IV, 1994 criteria) found BD-I was represented in 8.4% of the sample, BD-II in 12.4%, Bipolar II ½ in 33.5%, Bipolar III in 5.7%, and Bipolar IV in 4.5% of the population (Akiskal, Akiskal, et al., 2006).

**Cyclothymic temperament**. Prevalence estimates for Cyclothymic temperament are typically measured dimensionally, in which higher quantitative trait levels (or scores exceeding two standard deviations) are indicative of Cyclothymic temperament. However, some divergent findings have been found. For example, Akiskal et al. (1977) reported a prevalence of Cyclothymic temperament in 10% of a chronic outpatient population with various personality maladjustments. These individuals exhibited various bipolar features, such as unpredictable mood swings and dramatic shifts in behaviour from day to day, but failed to meet the sustained duration and DSM criteria for a BD. Furthermore, Akiskal and Mallya (1987) found 5% of referrals to a community health centre demonstrated increased Cyclothymic temperament scores. In a study of college students in Buffalo, New York,

Depue and co-workers (1981) discovered that 6% of a nonclinical sample showed cyclothymic moodiness indicative of Cyclothymic temperament.

More recently, when the TEMPS-A was administered to 985 nonclinical Chinese people aged between 18-60 years, 5.6% scored high for Cyclothymic temperament (Lin et al., 2013). A recent study that administered a Greek version of the TEMPS-A found that Cyclothymic temperament was present in 5% of the Greek population (Fountoulakis et al., 2014). In Poland, a sample of 521 college undergraduates were administered the TEMPS-A, high Cyclothymic temperament scores were found in 2.9% of this sample (Borkowska et al., 2010). Furthermore, when the TEMPS-A was administered to healthy subjects in a Hungarian normative sample, findings revealed that 4.2% were identified as having high Cyclothymic temperament scores (Rozsa et al., 2008). A sample of 948 non clinical participants taken from the mid–and South Italy revealed a much lower rate of 1.7% (Pompili et al., 2008). Alternatively, using a different measure of Cyclothymic temperament (the Temperament Evaluation of Memphis, Pisa, Paris & San Diego Interview: TEMPS-I), Maina et al. (2010) found the presence of Cyclothymic temperament in 12.3% of an Italian sample of people with major depressive disorder. When the TEMPS-A Cyclothymic scale was administered to a Tunisian sample of 98 outpatients with recurrent depression, findings showed that one third of participants (33.7%) had high Cyclothymic temperament scores (Mechri et al., 2011).

A limitation of the prevalence literature described above is that all of the studies vary in heterogeneity of methods and definitions of Cyclothymic temperament (for a review, see Vazquez et al., 2012). Nevertheless, several studies have been reviewed above that explore the distribution of Cyclothymic temperament and clinical BD among the general population.

**4.4 The Bipolar Spectrum: Age of Onset**

Typically, categorical BD emerges between the mid-teens and mid-20s (Cicero, Epler, & Sher, 2009; Waugh, Meyer, Youngstrom, & Scott, 2014). This is much earlier than the

onset of major depression, which ranges between the mid to late 20s (Jacobi et al., 2005). Kraepelin (1921) maintained that the peak age of bipolar onset falls within the *period of development* with its increased emotional excitability between the fifteenth and the twentieth year. Recent studies confirm Kraepelin's assertion. Tozzi et al. (2011) showed onset of BD peaks between ages 15 and 17 years. Goodwin and Jamison (2007) pooled the data from 15 studies reporting average age of onset in samples of patients with bipolar spectrum illness and derived a weighted mean of 22.2 years. In a large-scale survey that estimated prevalence and age of onset distributions of DSM-IV disorders in the USA, researchers found the age-of-onset distribution for BD ranged between the ages of 18-29 (Kessler, Berglund, Demler, Jin, & Walters, 2005). Similarly, retrospective studies reported that the first signs of BD were usually noticed between the ages of 15 and 29 years (Coryell et al., 2013; Lish et al., 1994; Oedegaard, Syrstad, Morken, Akiskal, & Fasmer, 2009)**.** Considering the peak age of BD onset, "it seems that a diagnosis in adulthood, during which time the illness is generally diagnosed, is much too late, and thus the prospect of recognising bipolar disorders in adolescence is very promising" (Hauser et al., 2007, p.93).

### 4.5 Summary of Chapter Four

As discussed in Chapter Three, positive early parent-child interactions are critical in the development of secure attachment dimensions, and secure attachment dimensions have been shown to predict positive social functioning. Literature reviewed in Chapter Four provides evidence for links between clinical BD and the insecure attachment dimensions (section 4.1.1), and between Cyclothymic temperament and the insecure attachment dimensions (section 4.1.2). Emerging research indicates that both BD and Cyclothymic temperament are predominantly associated with the anxious attachment dimension. Findings linking BPD to insecure attachment were also discussed. Furthermore, it seems separation anxiety and interpersonal rejection sensitivity might also be suggestive of an underlying

insecure attachment in people with BD, and possibly those with Cyclothymic temperament (section 4.1.3).

Furthermore, it is important to draw on literatures that pertain to the bipolar spectrum in childhood, adolescence, and early adulthood (section 4.2), prevalence (section 4.3) and age of onset (section 4.4). This additional general information is important developmentally in that it demonstrates the risk of progression to clinical BD is greater in children and adolescents with cyclothymic instability, with the peak age of onset for BD assumed to be between the mid-teens and mid-20s. Furthermore, in spite of the methodological differences, it seems Cyclothymic temperament is a widespread trait dimension that is found to various extents across populations. On the basis of the data discussed in Chapter 4, it is important to consider that perhaps individuals in the general population with a Cyclothymic temperament have an underlying insecure attachment. This in turn could have a negative impact on their level of relationship satisfaction. Chapter 5 offers an in-depth review of the literature linking the bipolar spectrum to difficulties in close relationships, whilst illuminating the importance of the family environment and the difficulties often associated with caring for someone with clinical BD.

# Chapter Five: The Bipolar Spectrum and Close Relationships

## 5.0 Overview of Chapter Five

Chapter Five begins by reviewing empirical evidence that suggests people with BD experience difficulties in relationships and lower levels of relationship satisfaction. These relationship difficulties can occur during both the elevated and depressive phase of bipolar illness. However, close relationships seem to fare worse during the manic or hypomanic phase. Cognitive deficits, emotional instability and disruptive behaviour (especially increased volatility and irritability) appear to be just a few of the features associated with clinical BD that could contribute to lower levels of relationship satisfaction (section 5.1).

Although there is little data available, a study by Akiskal et al. (1977) suggests that Cyclothymic temperament is similarly associated with relationship difficulties (section 5.1.1).. Although relationship status in people with BD is not the focus of the current study, it is important to draw on data linking BD to relationship status to highlight some of the relationship difficulties that people with BD can face (section 5.2). Separation, divorce or social isolation appears common in people with BD, which in turn has an adverse effect on general well-being and life quality. A selection of studies are also reviewed to highlight the importance of the family environment (section 5.3). For instance, certain aspects of family functioning such as exposure to childhood trauma, parental BD, adverse childhood experiences including stressful and dysfunctional environments may have an adverse effect on the emergence of BD (section 5.3.1), insecure attachment and development of close relationships (section 5.3.2). Some of the difficulties associated with caring for someone with BD are also discussed (section 5.3.3). This additional background information is important as it may have implications for therapy when working with people with BD (section 5.3.4). For instance, it is possible that the exposure to an unpredictable caregiving environment could

interfere with the development of an insecure attachment in people vulnerable to BD, which in turn, potentially underpins the quality and satisfaction in their future relationships.

### 5.1 The Bipolar Spectrum and Close Relationships

> "*Being involved in a close relationship can sometimes be like riding the waves of the open sea. Partners can negotiate the steering of the boat, the height and direction of the sails, and how long they remain aboard, but rough waters may still affect one partner more than another*" (Knee, Canevello, Bush, & Cook, 2008, p.608).

Few matters spark more lively interest in the course of ordinary thought and conversation than the topic of relationships. Several important questions remain about why some relationships are satisfying, while others are fraught with problems and dissatisfaction. BD not only affects individuals who have the disorder but also their partners, family and caregivers (Bauer et al., 2011; Ogilvie, Morant, & Goodwin, 2005; Perlick et al., 1999; Siegel et al., 2015). The domain most negatively affected appears to be close relationships, such as that with spouse or committed partner (Cramer, Torgersen, & Kringlen, 2010; Dore & Romans, 2001; Elgie & Morselli, 2007; Greenberg, Rosenblum, McInnis, & Muzik, 2014). It is therefore remarkable how little attention has been given to the effects of BD and the bipolar spectrum on relationship outcomes.

A review examining the relationship outcomes in people with BD found that 30-60% have detectable levels of psychosocial impairment (MacQueen, Young, & Joffe, 2001). Repeated conflict and an increase in aggressive, irritable and violent behaviours are often a recurrent problem in people with BD (Beentjes, Goossens, & Poslawsky, 2012; Coryell et al., 1993; Dore & Romans, 2001; Miklowitz, Goldstein, Nuechterlein, Snyder, & Mintz, 1988; Sheets & Miller, 2010; Whisman, 2007). Inappropriate or volatile behaviour, low relationship satisfaction, and relationship difficulties, can be particularly pronounced during episodes of

severe mania or hypomania (Akiskal, 1995; Hellvin, Sundet, Aminoff, Andreassen, & Melle, 2013; Judd et al., 2005; Lam, Donaldson, Brown, & Malliaris, 2005; Michalak, Torres, Bond, Lam, & Yatham, 2013). During episodes of mania or hypomania, people with BD can exhibit overactive, irritable, aggressive and violent behaviours that are of major concern to partners. Their partners can also find it difficult to sustain the relationship after these types of interpersonal expression (Dore & Romans, 2001). Lam et al. (2005) found that 100% ($N$ = 37) of partners of people with BD thought that verbal aggression, when present, was problematic and 93% had experienced offensive behaviour. For instance, during an angry outburst the person with BD may say and do things that are out of character.

> "*Sometimes my anger is so strong I feel like I'm going to explode. It feels so good to hit something or yell or start a fight. It's a release from all of the pressure inside. It doesn't even feel wrong at the time. It feels like something I have to do* (Fast & Preston, 2004, p.31).

Other manic and hypomanic symptoms that can contribute to relationship problems include, blaming of others, unstable mood, unpredictable behaviour, financial extravagance, and decreased sleep (Lam et al., 2005; Mueser, Webb, Pfeiffer, Gladis, & Levinson, 1996). Problems may also arise within the sexual relationship. For instance, hypersexuality, promiscuity, and extra-marital affairs are not uncommon in severe mania and hypomania (Dore & Romans, 2001; Lam et al., 2005). In addition, impulsive, high risk-taking sexual behaviour can significantly increase the risk of HIV infection in people with BD (de Sousa Gurgel et al., 2013; Perretta et al., 1998). These sorts of behaviours are further intensified in people with BD who are untreated, inadequately treated, or treatment non-responsive (Hellvin et al., 2013; Lesser, 1983).

Depressive symptoms and episodes are at least as disruptive as manic or hypomanic symptoms (Judd et al., 2005). A recent cross-sectional study of 48 out patients in Jaipur, found that 50% of people diagnosed with BD experienced "severe" levels of relationship impairment during depressive episodes. A further 44% reported "moderate" levels, while only 6% reported "mild" levels of relationship impairment (Mehta, Mittal, & Swami, 2014). Interpersonal difficulties included frequent arguments with family members, deficits in emotional closeness, avoiding seeing relatives and deriving no pleasure in meeting with them. The sample as a whole reported having no close friends and almost no social contacts (Mehta et al., 2014). Similarly, Dore & Romans (2001) established that 90% of partners or caregivers found their partner distant and difficult to get close to during depressive episodes. Furthermore, during the depressed phase of the illness, the depressed person may be particularly sensitive to perceived rejection or criticism, and minor or even non-existent slights are exaggerated or interpreted inaccurately (Benazzi, 2000a, 2000c). All of these common interpersonal difficulties associated with the depressive phase of BD may further intensify tension in relationships.

Finally, neurocognitive impairment, particularly facial emotion recognition, may contribute to reduced relationship satisfaction. Facial emotion recognition deficits are well documented in BD, and are characterised by a bias to over perceive negative emotion in others (Hoertnagl et al., 2011; Kohler, Hoffman, Eastman, Healey, & Moberg, 2011). These emotion-specific deficits are especially evident in the misperception of anger, fear and disgust, particularly when manic (Hoertnagl et al., 2011; Lembke & Ketter, 2002; McClure, Pope, Hoberman, Pine, & Leibenluft, 2003), as well as generalised deficits in the recognition of all emotions (Getz, Shear, & Strakowski, 2003; Kohler et al., 2011). The impaired perceptions of the intentions, or emotional states of their partner, or other significant people,

could greatly affect how people with BD react in social situations (Dutra et al., 2014; Miklowitz, 2011; Van Rheenan & Rossell, 2013).

### 5.1.1 Cyclothymic temperament and close relationships.

To the present author's knowledge, only one published study has to some degree addressed possible associations between Cyclothymic temperament and relationship outcomes. Specifically, Akiskal et al. (1977) found that Cyclothymic temperament was associated with serious problems in interpersonal relationships that included unexplained promiscuous behaviour, extra marital affairs and explosive, aggressive outbursts.

Akiskal et al. (1977) collected data over a period of 15 months on 500 psychiatric patients with mood instability who had never been hospitalised for depression, hypomania, or mania were screened to identify cases of Cyclothymic temperament. The researchers identified 46 patients who exhibited some features of both hypomania and depression, but failed to meet the duration criteria for diagnosable BD. The primary reasons for seeking psychiatric help were, in all cases, related to serious problems in interpersonal, scholastic, or vocational areas. About half the sample experienced irritable periods lasting a few days and suffered from explosive aggressive outbursts that were often followed by periods of guilty rumination. Repeated buying sprees, financial extravagance, or financial disasters were reported by 75% of the sample. Furthermore, 40% reported episodic or unexplained promiscuous behaviour or extra marital affairs that occurred in a self-defeating fashion that often led to self-criticism and remorse when the depressive swing supervened. These behavioural manifestations were associated with multiple romantic breakups or marital failure.

## 5.2 The Bipolar Spectrum and Relationship Status

Although links between the bipolar spectrum and relationship status are not the focus of the current project, a review of the literature is important as it illuminates the potential

relationship issues that can occur in people with trait vulnerability to BD and clinical BD. While there has been no direct empirical investigation of Cyclothymic temperament and relationship status, a small number of studies have revealed associations between hypomania proneness and relationship status. For instance, several studies have found that individuals' reporting subclinical hypomanic traits were less likely to be married and more likely to be separated or divorced than individuals without these features (Angst, 1998; Judd & Akiskal, 2003; Judd, Akiskal, Schettler, Coryell, Endicott, et al., 2003; Judd, Akiskal, Schettler, Coryell, Maser, et al., 2003).

Social isolation and separation/divorce because of illness-related difficulties are common in people with BD (Akiskal, Kilzieh, et al., 2006; Coryell et al., 1993; Dore & Romans, 2001; Lieberman, Massey, & Goodwin, 2010; Lish et al., 1994; Szadoczky et al., 1998; Wicki & Angst, 1991). The risk of social isolation, separation and divorce are reported to be higher in people with a BD than in those with unipolar depression (Akiskal, Kilzieh, et al., 2006; Akiskal et al., 1995). Furthermore, the relationship status of a person with BD appears to be an important factor in determining outcomes such as relapse, symptom severity and level of functioning (Sheets & Miller, 2010; Wingo, Baldessarini, Holtzheimer, & Harvey, 2010).

Some naturalistic studies have found that people with BD are less likely to be in a relationship or married than those without this diagnosis (Goodwin & Jamison, 2007; Kessler et al., 1997). For example, in a large 5-year follow up study of 148 patients with BD, Coryell and colleagues (1993) established that 32% of patients never married, compared to 15% of matched controls. Additionally, amongst people who had married, divorce was more than twice as common amongst those with a BD diagnosis (48%) compared to those without (18%). In a large-scale survey of members of the National Depressive and Manic-Depressive Association (National DMDA), Lish et al. (1994) found that 57% of adult patients with BD

were either divorced or had marital difficulties, a further 47% of patients with BD remained unmarried. Furthermore, as measured by a Hungarian version of the Diagnostic Interview Schedule (DIS) a Hungarian national survey by Szadoczky et al. (1998) found that, irrespective of gender, the rate of never being married, separation and divorce is significantly higher among those with BD than those without.

Some differences in relationship status have also been noted among the subtypes of BD. For instance, one study found that 19-23% of adults with BD-I are married, compared to 60% of the general population (Huxley & Baldessarini, 2007). Further, in a sample of 98 BD-I, 64 BD-II, and 251 unipolar major depressive disorder patients, the rates of separation and divorce were 26.5% - 29.7% and 18.8% respectively (Akiskal, Kilzieh, et al., 2006). One longitudinal study found that people who converted from a major depressive disorder to BD-II were more socially withdrawn, less likely to be married or living with a partner, and more likely to be separated, divorced or never married than non-converters. Specifically, the risk of marital disruption remained 1.7 times higher for BD-II converters than for unipolar patients (Akiskal et al., 1995). A more recent study found that among men there was a preponderance of BD-I among the never married participants and, a preponderance of BD-II among the married ones (regardless of gender; Lieberman et al., 2010). Finally, a longitudinal study carried out by Wicki and Angst (1991) found a strong association between BD-II and interpersonal conflicts and relationship distress. The divorce rate measured at age 30 was 2.6 fold higher among people with BD-II than for non-affected controls (13% vs. 5%). BD-II was also found to be more frequent among those who never married (61% vs. 51%) than controls of the same age.

These studies suggest a close association between the bipolar spectrum, BD and relationship status. Social isolation, and broken relationships can, in turn, have a detrimental effect on the life quality of people with BD (Cramer et al., 2010; Gutierrez-Rojas et al., 2008;

Hirschfeld, Lewis, & Vornik, 2003; Michalak et al., 2013; Michalak, Yatham, Kolesar, & Lam, 2006; Michalak, Yatham, & Lam, 2005). A recent study examining the relationship between quality of life and BD in 35 affected people found that social support networks (i.e., intimate relationships, close ties with family members, friends or the wider community) were regarded as being of greatest importance in determining overall life satisfaction (Michalak et al., 2006). Taken together, these studies suggest that people with BD generally have trouble with relationships, which has a marked effect on their general well-being and life satisfaction.

### 5.3 The Bipolar Spectrum and the Family Environment

Although the current project does not directly investigate developmental experiences in the family of origin, it is useful to consider how early family functioning could influence how people with trait vulnerability to BD experience close relationships. This additional background information is important as it may also help strengthen the suggestion that insecure attachment mediates the relationship between Cyclothymic temperament and relationship satisfaction. For instance, separate to the genetic trait heritability of BD (Kelsoe, 2003), the child born to a parent with a BD has a significantly greater environmental risk of developing a BD than the offspring of parents without bipolar illness (Akiskal et al., 1985; Alloy et al., 2005; DelBello & Geller, 2001; Ferreira et al., 2013; Sucksdorff et al., 2014). The risk is argued to be four times greater when compared to children of parents without BD (Lapalme et al., 1997; Sucksdorff et al., 2014). Thus, it is expected that children of bipolar parents are exposed to detrimental psychosocial influences because they are being raised by a parent with a severe chronic affective illness (Alloy, Abramson, Smith, Gibb, & Neeren, 2006; Lapalme, Hodgins, & LaRoche, 1997; Moreno et al., 2012). These differences in development may have implications for treatment.

### 5.3.1 The family environment and the emergence of BD

There is evidence that family relations in families with a parent with BD can be seriously disturbed. For example, the divorce of parents is associated with an increase in mood instability in offspring (Gunther, Drukker, Feron, Korebrits, & van Os, 2005). Growing evidence also suggests that frequent and severe incidences of childhood trauma are a major predisposing factor for the emergence of BD (Etain, Henry, Bellivier, Mathieu, & Leboyer, 2008; Etain et al., 2010; Leverich et al., 2002; Perna, Vanni, Di Chiaro, Cavedini, & Caldirola, 2014). Family stressors, such as marital difficulties, parenting problems, childhood emotional neglect and abuse are the main form of trauma associated with BD (Etain et al., 2013; Etain et al., 2010). A review of studies that focused on associations between childhood trauma and BD, found that environmental stressors such as abuse and neglect may alter the organisation of brain development, leading to inadequate affective regulation (Etain et al., 2008), thus impairing the abilities to integrate emotion, cognition and behaviours into the development of a mature concept of self in adulthood (Perna et al., 2014). Another study found that more than 50% of patients with BD ($N = 100$) experienced some form of neglect and abuse (Garno, Goldberg, Ramirez, & Ritzler, 2005). Those who experienced severe levels of abuse that included a history of physical or sexual abuse (for a review, see Alloy, Abramson, Smith, et al., 2006) had a significantly higher rate of earlier onset, lifetime substance misuse, rapid cycling BD and comorbidity (Garno et al., 2005).

### 5.3.2 The family environment, parents with BD and insecure attachment

The exposure to a positive, warm, rewarding and nurturing environment appears to be a common experience in many children born to a parent with BD (Reichart et al., 2007). More specifically, Reichart et al., (2007) compared 1122 young adults in the general population with 129 offspring of 80 parents with BD. These researchers found the offspring growing up in a family with a parent with BD perceived their parents overall in a more

positive way. In particular, mothers with BD were perceived as significantly less rejecting, more emotionally warm and less overprotecting than in families from the general population. In contrast to the findings of Reichert et al. (2007), some studies have found that families with a parent with BD differ from the average family in having less cohesion and more conflict (Belardinelli et al., 2008; Chang, Blasey, Ketter, & Steiner, 2001; Ferreira et al., 2013; Romero, DelBello, Soutullo, Stanford, & Strakowski, 2005). Children as young as two years old with a parent with BD have demonstrated heightened distress and a preoccupation with the conflicts and suffering of others, especially disturbances in adults. These children had difficulty maintaining friendly social interactions and demonstrated problems dealing with hostile impulses and maladaptive patterns of aggression (Zahn-Waxler et al. 1984).

It would be reasonable to predict that parents or caregivers unwell with BD may be less able to tolerate their children, (especially children exhibiting maladaptive behaviour) due to the symptoms associated with their own clinical illness. If this is the case, the prolonged exposure to negative communication styles (Vance, Jones, Espie, Bentall, & Tai, 2008) and rejecting, over-critical and punitive parental styles characterized by a lack of warmth and caring, and negative psychological control, (e.g., criticism, intrusiveness, induction of guilt, withdrawal of love; Alloy et al., 2006; Alloy et al., 2005; Neeren et al., 2008) is likely to interfere with attachment relationships (Fowler, Allen, Oldham, & Frueh, 2013; Pearlman & Courtois, 2005; Zilberstein, 2014). Some evidence consistent with this prediction is mothers with BD and an insecure attachment were found to affect the attachment dimension in their children in that their children also exhibited insecure attachment (Kokcu et al., 2010). Conversely, the child's insecure attachment was found to have a negative effect on the parent with BD in that they exhibited higher rates of atypical depression, psychotic symptoms, suicide attempts, rapid cycling and sudden onset of symptoms and comorbidity with BPD (Kokcu et al., 2010). This result suggests that insecure attachment and the pattern of BD may

be a reciprocal process in which the parent influence's the child and the child influences the parent (Hong & Park, 2012). Central to this notion is the goodness of fit between the child's temperament and the demands of their environment (Thomas & Chess, 1984).

### 5.3.3 Caring for someone with BD

The demands of caring for someone with BD can generate significant stress and place burden on partners and family members (Bauer et al., 2011; Beentjes et al., 2012; Fast & Preston, 2004; Ogilvie et al., 2005; Perlick et al., 1999). These demands can adversely affect psychological outcomes for both the affected individual (Miklowitz, 2011; Miklowitz et al., 1988) and the non-affected partner or spouse (Steele, Maruyama, & Galynker, 2010). For instance, Lam et al. (2005) found that, despite the non-affected partner's commitment to the couple relationship, 46% reported psychiatric distress indicative of them being psychologically unwell. A high level of stress in partners or caregivers as a consequence of the patient's illness is common and can further contribute to relationship problems (Dore & Romans, 2001).

Furthermore, the attitudes of partners or spouses towards their ill partner can significantly affect relationship outcomes. For instance, using the 32-item Marital and Dyadic Adjustment Scale (designed to measure dyadic cohesion, dyadic satisfaction, dyadic consensus, and affective expression), Levkovitz et al. (2000) found that the spouses or partners of patients in remission from their illness, when compared to spouses of healthy controls, score lower on consensus, unity and expressions of affection in their marital relationship. In addition, they perceived significantly more negative characteristics in their marriage, lower marital satisfaction, and more negative and fewer positive traits in their partner (Levkovitz et al., 2000). Otherwise, Dore & Romans (2001) found that during times of remission, the relationship significantly improved and remained close. That is, caregivers believed that their partners BD had brought them closer together.

Non-affected partners or significant others that show high expressed emotion (EE) described as increased levels of critical, hostile or emotionally overinvolved (overprotectiveness) attitudes toward a family member with BD can significantly increase the risk of relapse and predict a poorer outcome of the illness (Hooley, 2007; Miklowitz et al., 1988; Proudfoot, Doran, Manicavasagar, & Parker, 2011; Yan, Hammen, Cohen, Daley, & Henry, 2004). Research suggests that partnerships or family environments that exhibit high levels of EE are "often locked into negatively escalating cycles of communication in which criticism and counter-criticism among family members and patients become highly reciprocal and mutually influential" (Miklowitz, 2011, p. 506). Low levels of social support and negativity are likely to evoke or exacerbate cumulative levels of relationship stress, which in turn increases the risk of symptom expression (Johnson, Winett, Meyer, Greenhouse, & Miller, 1999; Levkovitz et al., 2000; Simoneau, Miklowitz, & Saleem, 1998). Alternatively, greater levels of social support are associated with a stress response decline and symptomatic recovery (Johnson et al., 1999; Wingo et al., 2010).

### 5.3.4 Insecure attachment as a mechanism of therapeutic change in BD

Evaluating insecure attachment dimensions as a mechanism of therapeutic change is important as it may inform understandings of the pathways that lead to relationship dissatisfaction and problems in people with BD (and trait vulnerability to BD). None of the existing evidence-based adjunctive psychological treatments for BD explicitly address insecure attachment and relationship problems in people with BD (Salcedo et al., 2016). This is in spite of evidence that individuals with BD generally have insecure attachment and experience difficulties with relationships across the lifespan (Greenberg et al., 2014). The current study supports suggestions that assessing attachment dimensions might inform service provision for individuals with BD who report significant relationship dysfunction and distress.

Of the existing evidence-based adjunctive psychological treatments for BD, it would seem that Family-focused Therapy (FFT) (Miklowitz & Chung, 2016) with its strong interpersonal focus would be best suited to the inclusion of attachment-related and schema constructs. FFT for BD considers the impact of the patient's family on the course of the disorder as well as the extent to which the emotional experiences of BD affect the patient's family members (Miklowitz & Chung, 2016; Reinares, Bonnin, Hidalgo-Mazzei, Sanchez-Moreno, et al., 2016). Specifically, FFT aims to reduce stress in the home environment through three primary components; psycho-education, communication enhancement, and problem-solving training (Miklowitz & Chung, 2016; Miklowitz & Gitlin, 2015; Miklowitz et al., 2013). There is evidence that FFT improves outcomes in BD and enhances the marital and family environment (Jones, 2004; Reinares, Bonnin, Hidalgo-Mazzei, Sanchez-Moreno, et al., 2016). Findings of the present project encourage future research to explore development of new attachment-related cognitive schemas as an additional theory-driven potential target of therapeutic activities within FFT.

**5.4 Summary of Chapter Five**

The research suggests that the close relationships of people with BD are considerably compromised (section 5.1). Although research is restricted, relationship difficulties also appear marked in people with Cyclothymic temperament (section 5.1.1). A review of relevant studies indicates that people with clinical BD are less likely to be married and more likely to be separated or divorced than individuals without this disorder (section 5.2). Family environment is important in that there are potential implications of being reared by a parent with BD (section 5.3). The research seems to suggest that negative interactions between a parent with BD and their child, not only has implication in the emergence of BD (section 5.3.1), but could potentially interfere with the offspring's ability to develop a secure attachment (section 5.3.2), to the degree that internal working models, emotional regulation

strategies and social functioning are compromised. Caring for someone with BD places considerable demands on partners and family members (section 5.3.3).

The lack of attention to insecure attachment in the BD clinical literature may constitute a missed opportunity to improve family interventions by helping people with clinical BD who are experiencing relationship distress and dissatisfaction (section 5.3.4). Existing psychological interventions for BD have been largely behavioural or cognitive-behavioural, with psychoeducational foci. A benefit of testing anxious and avoidant attachment as mediators is the potential for therapeutic approaches to be enhanced, particularly in the context of Family- Focused Therapy (FFT) for BD (Miklowitz & Chung, 2016).That is, uncovering insecure attachment as a mechanistic process could highlight the importance of assessing for insecure attachment in people who present with vulnerability to BD and relationship difficulties.

# Chapter Six: Aims and Hypotheses

## 6.0 Overview of Chapter Six

Drawing on the synthesis of literature reviewed above, there is evidence to suggest that insecure attachment dimensions could mediate the relationship between Cyclothymic temperament and relationship satisfaction. This chapter begins with the rationale for the present project (section 6.1). Then, the overall aims and study design (section 6.2), including the specific hypotheses and research questions are described (sections 6.3-6.6).

## 6.1 Rationale for the present project

There are important gaps in the literature linking Cyclothymic temperament to relationship satisfaction. Specifically, does insecure attachment play a mediating role between Cyclothymic temperament and relationship satisfaction? Understanding these mechanisms could result in a better conceptualisation of some of the ways in which Cyclothymic temperament may lead to lower relationship satisfaction. Importantly, this study aims to test potential mediating effects of insecure attachment from a one-dimensional (Cyclothymic temperament) and two-dimensional (hypomania and depression proneness) perspective. A dimensional framework and path analysis were employed to test three models - a one-dimensional, two-dimensional and a nested model - which represented different conceptualisations of the complex relationships between Cyclothymic temperament, insecure attachment and relationship satisfaction.

Even though categorical BD is not measured in the current study, an assumption of the present project is that Cyclothymic temperament is related to BD. That is, the presence of Cyclothymic temperament predisposes a person to developing BD. Chapter two amply demonstrated that they key features of BD are not dependent on the conceptualisation as a categorical construct. A review of the literature indicates that an insecure attachment and relationship difficulties are closely associated with a BD diagnosis. Relationship problems are

reported to occur during both the elevated and depressive phase of the illness. Thus, the current findings may help generate testable hypotheses for longitudinal and intervention studies regarding the aetiology, maintenance and treatment of relationship issues in BD.

### 6.2 Aim and Study Design

The primary aim of this project was to better understand the relationship between Cyclothymic temperament and relationship satisfaction by investigating the potential mediating role of insecure attachment. Psychologists have long recognized the importance of mediating variables of which mediational analysis remains prominent in psychological theory and research (MacKinnon, Fairchild, & Fritz, 2007; Windgassen, Goldsmith, Moss-Morris, & Chalder, 2016). Mediators speak to how or why such effects occur, and with mediation analysis, we gain insight and acquire a deeper understanding of the mechanisms underlying the connection between two or more variables (Baron & Kenny, 1986; Gunzler, Chen, Wu, & Zhang, 2013; Wu & Zumbo, 2008). Furthermore, mediation analysis is frequently used within the Structural Equation Modelling framework (SEM), which is critical if we are to advance our understanding of psychological therapies, "the more mediation studies that are conducted in a more rigorous fashion, the more insight can be gathered into therapeutic mechanisms" (Windgassen et al., 2016, p.98).

A single cross-sectional study was conducted to address this aim. To address this aim multiple analyses were conducted. The primary analyses associated with this aim used path analysis, and to account for the complexity of the Cyclothymic temperament construct, three different models were tested (one-dimensional, two-dimensional and a nested model). SEM was chosen in the current study as it lends itself especially well to using empirical data for testing theory driven causal connections between indicator variables, and is popular in the social sciences due to the ability to handle multi-equation models and multiple measures of concepts, while still accounting for measurement error (Crowley & Fan, 1997). Furthermore,

SEM is argued to outperform regressions in detecting mediation results when they are present in the population (Iacobucci, Saldanha, & Deng, 2007).

Implied by the literature, hypotheses were set in relationship to the first model, but in the absence of guidance from the literature, investigations of the second and third models were framed by less specific research questions about the presence of mediation.

Secondary analyses were also conducted to support and aid interpretation of the primary path analyses. These secondary analyses took three forms:

1) Investigation of bivariate relationships contained in the path analysis models. Primary amongst these bivariate analyses, was testing of the putative link between Cyclothymic temperament and relationship satisfaction.

2) Investigation of external correlates of the Relationship Assessment Scale (RAS): More specifically, in order to strengthen inferences based on the key dependent variable of the design, the current study sought to investigate several relationship variables and their associations with relationship satisfaction. These included: relationship status, cyclothymic moodiness in the context of a close relationship (measured on the CRS), the ability to maintain a relationship (measured on a 5-point Likert scale) and relationship duration. In turn, the study sought to investigate the association between relationship satisfaction and satisfaction with life (measured on the SWLS).

3) Investigation of the psychometric properties of the CRS: More generally, design of the CRS was an exploratory aspect of the present project, distinct from the overarching mediation prediction, and the CRS was not used in the core hypothesis testing. The distinct secondary aim of the project was to design a new measure for future research that, should the present hypotheses be confirmed, could be used to

explore the process of Cyclothymic moodiness, insecure attachment and relationship satisfaction more closely. The current study aimed to analyse the psychometric properties of the scale and present reliability and validity evidence to support its use in the future if the present hypotheses are supported. Psychometric validation of this new measure was examined through principal axis factoring (PAF) and inspection of correlates between CRS and the TEMPS-Cyclothymic, GBI-hypomania and GBI-depression, ECR-anxious, ECR-avoidant, RAS and the SWLS.

## 6.3 Hypotheses and Research Questions

### 6.3.1 Investigation of the Bivariate Relationships between Trait Vulnerability to BD, Insecure Attachment and Relationship Satisfaction

Before model fitting, expected bivariate relationships between the key variables in the models were tested. First, the bivariate relationship between Cyclothymic temperament and relationship satisfaction was explored. This was then followed by the bivariate relationship between Cyclothymic temperament and insecure attachment dimensions. Then, the relationships between Cyclothymic temperament and hypomania and depression proneness were investigated. Following this, the associations between hypomania and depression proneness and relationship satisfaction were examined. Finally, the relationships between hypomania and depression proneness and insecure attachment dimensions were investigated. It was predicted that:

**H2:** There would be a significant negative correlation between Cyclothymic temperament and relationship satisfaction.

**H2a:** there would be a significant positive correlation between Cyclothymic temperament and anxious attachment.

**H2b:** there would be a significant positive correlation between Cyclothymic temperament and avoidant attachment.

**H2c:** there would be a significant positive correlation between Cyclothymic temperament and hypomania proneness.

**H2d**: there would be a significant positive correlation between Cyclothymic temperament and depression proneness.

**H2e:** there would be a significant negative correlation between hypomania proneness and relationship satisfaction.

**H2f:** there would be a significant positive correlation between hypomania proneness and anxious attachment.

**H2g:** there would be a significant positive correlation between hypomania proneness and avoidant attachment.

**H2h:** there would be a significant negative correlation between depression proneness and relationship satisfaction.

**H2i:** there would be a significant positive correlation between depression proneness and anxious attachment.

**H2j:** there would be a significant positive correlation between depression proneness and avoidant attachment.

### 6.3.2 Structural modelling of Cyclothymic temperament, insecure attachment and relationship satisfaction: One dimensional model.

The first research question was: Is Cyclothymic temperament, as defined within Akiskal's framework, associated with lower relationship satisfaction? To date, it is not clear

how Cyclothymic temperament and relationship satisfaction may be related to one another. The current project sought to test a novel, face-valid mechanism. Specifically, it was proposed that the association between Cyclothymic temperament and relationship satisfaction is mediated by the two dimensions of insecure attachment, namely – anxious and avoidant attachment. Cyclothymic temperament was measured using the TEMPS-Cyclothymic scale (see section 7.4) and relationship satisfaction was measured using the RAS (see section 7.6). Insecure attachment was measured using the ECR-R which has two subscales the ECR-anxious and ECR-avoidant subscales (see section 7.5).

Path analysis was used to model the proposed direct links from Cyclothymic temperament to relationship satisfaction, testing the hypothesised importance of anxious and avoidant attachment dimensions as mediating factors. The starting model of this analysis is shown in Figure 3. Mediation analysis was used as it provided an added dimension that may help to explain why lower relationship satisfaction could be a consequence of Cyclothymic temperament in a nonclinical sample. Thus, it was hypothesised:

**H1**: Anxious attachment would mediate the relationship between Cyclothymic temperament and relationship satisfaction.

**H1a**: Avoidant attachment would mediate the relationship between Cyclothymic temperament and relationship satisfaction.

### 6.3.3 Structural modelling of hypomania and depression proneness, insecure attachment and relationship satisfaction: Two dimensional model.

Consistent with other two-dimensional approaches in which trait vulnerability to BD is viewed as two interrelated but separable dimensions (see section 2.4.2), another important aim of the current project was to model Cyclothymic temperament within a two-dimensional framework (hypomania and depression proneness) and ascertain the proposed mediation

effects for hypomania proneness and depression proneness. Hypomania and depression proneness were measured using the sGBI which has two subscales the GBI-hypomania and GBI-depression subscales (see section 7.7). Path analysis were again used to examine the distinct but interrelated effect of hypomania and depression proneness and their direct and indirect associations with relationship satisfaction, again testing the importance of insecure attachment as a mediating factor.

The starting model of this analysis is shown in Figure 5. The importance of investigating trait vulnerability to BD from a two-dimensional (hypomania and depression proneness) perspective aims to offer a more complete exploration of the complex associations between Cyclothymic temperament, insecure attachment and relationship satisfaction. As no previous research has investigated associations between these variables and relationship satisfaction, no specific hypotheses were set. Rather, drawing on the clinical literature reviewed in Chapter 5, that illustrated associations between hypomanic and depressive symptoms and relationship difficulties, a research question was framed: Is the relationship between hypomania proneness and depression proneness on the one hand and relationship satisfaction on the other mediated through insecure attachment dimensions (anxious and avoidant attachment)?

### 6.3.4 Cyclothymic temperament: nested model.

Finally, for completeness, a third SEM model sought to model the relationship between Cyclothymic temperament, insecure attachment and relationship satisfaction in a way that captures both the construct of Cyclothymic temperament from a one-dimensional and two-dimensional perspective. That is, to see what can be learnt in the modelling process, the Final Model 1 (see Figure 4) and the Final Model 2 (see Figure 6) were nested within an aggregate model (see Figure 8). In the nested model, Cyclothymic temperament is broken down into its two putative constituent dimensions (hypomania and depression proneness).

The hypothesised mediation effects of insecure attachment were again tested. Figure 8 shows this plausible alternative to the one-dimensional and two-dimensional models described above.

Again, as no previous research has investigated associations between these variables and relationship satisfaction, no specific hypotheses were set. Rather, a research question was framed: Do insecure attachment dimensions (anxious and avoidant attachment) mediate the relationship between a nested model of Cyclothymic temperament (including facets of hypomania and depression proneness) and relationship satisfaction?

### 6.4 Investigation of the External Correlates of the Relationship Assessment Scale (RAS)

It was predicted that:

**H3:** there would be a significant difference between relationship status and relationship satisfaction.

**H3a:** there would be a significant positive correlation between the ability to maintain a relationship and relationship satisfaction.

**H3b:** there would be a significant positive correlation between relationship duration and relationship satisfaction.

Finally, research suggests that lower levels of relationship satisfaction may have an adverse effect on the perceived quality of life in people with BD (see Chapter Five, section 5.2). Therefore, based on this assumption, the current study sought to determine the bivariate association between levels of relationship satisfaction and satisfaction with life. It was predicted that:

**H3c:** there would be a significant positive correlation between relationship satisfaction and satisfaction with life. Furthermore,

H3d: there would be a significant negative correlation between cyclothymic moodiness within the context of a close relationship and relationship satisfaction (also hypothesised below).

## 6.5 Investigation of the Psychometric Properties of the Cyclothymic Relationship Scale (CRS)

As the CRS was designed to examine three domains of cyclothymic moodiness within a close relationship (i.e., cognitive, emotional and behavioural) it was predicted that:

**H4:** the CRS would demonstrate a three factor structure.

**H4a:** the CRS would demonstrate satisfactory internal consistency as measured in Cronbach alpha (α).

External validity of the CRS with external correlates was also examined. Thus, it was predicted that:

**H4b:** there would be a significant positive correlation between cyclothymic moodiness within the context of a close relationship and Cyclothymic temperament.

**H4c:** there would be a significant positive correlation between cyclothymic moodiness within the context of a close relationship and anxious attachment.

**H4d:** there would be a significant positive correlation between cyclothymic moodiness within the context of a close relationship and avoidant attachment.

**H4e:** there would be a significant positive correlation between cyclothymic moodiness within the context of a close relationship and hypomania proneness.

**H4f:** there would be a significant positive correlation between cyclothymic moodiness within the context of a close relationship and depression proneness.

**H4g:** there would be a significant negative correlation between cyclothymic moodiness within the context of a close relationship and satisfaction with life.

As hypothesised above, it was predicted that:

**H3d:** there would be a significant negative correlation between cyclothymic moodiness within the context of a close relationship and relationship satisfaction.

# Chapter Seven: Method

## 7.0 Overview of Chapter Seven

This chapter details the study method (section 7.1). This is followed by details of the study design (section 7.2), demographic information (section 7.3) and a detailed summary of the seven psychometric measures and demographic items. The new scale designed for the study, the CRS, is also described in detail along with the other measures utilised (sections 7.4 – 7.10), and the study procedure (section 7.11). Although some of the analytic method is covered off in the previous chapter, the chapter concludes with a detailed description of the analytic approach (section 7.12).

## 7.1 Participants

Participants were recruited by online links (including postings on mood disorder websites and social network sites). To participate in the study, participants had to fulfill the following criteria: (1) have experienced at least one committed relationship; (2) be aged between 18 and 65 years of age and (3) have adequate comprehension of the English language.

From six hundred and ninety five respondents, 359 provided valid data and were included in the analyses. Most respondents were women (male $n$ = 69, female $n$ = 290), and the majority of respondents (57.5%) were born in Australia, and 33.1% were from other English speaking countries (i.e., Canada, Ireland, New Zealand, South Africa USA and UK). The mean age of the sample was 34.78 years ($SD$ = 12.33). Modal education level was postgraduate education (43.2%). The vast majority of participants were heterosexual (92.2%), with 34.5% reporting they were never married but were in a committed relationship, and 33.6% indicating they were currently married.

### 7.2 Design

An anonymous web-based cross-sectional survey was designed for the current project. The survey used seven different self-report measures to elicit information about Cyclothymic temperament, hypomania and depression proneness, insecure attachment dimensions and relationship satisfaction.

### 7.3 Demographic and Relationship Information

Prior to completing seven scales, participants were asked to give their age, gender and highest level of educational attainment. Two further items asked participants to indicate their country of birth and the country in which they were currently living. Participants were also asked to indicate what best described their current relationship status. These options were: married, separated, divorced, widowed, single, and previously married currently in a committed relationship, previously married currently in a casual relationship, never married currently in a committed relationship and never married currently in a casual relationship. Participants were also asked to indicate the approximate duration of their current relationship status (in months and/or years), their sexual orientation (heterosexual, bisexual, homosexual) and the approximate number of committed and casual relationships (based on their own understanding of whether they felt the relationship was committed or casual). Finally, in order to shed some light on how the ability to maintain a relationship may contribute to levels of relationship satisfaction, participants were asked: "Overall, how would you rate your ability to maintain romantic relationships?" using a five-point rating scale that ranged from 1 (*poor*) to 5 (*excellent*) (see Appendix C).

### 7.4 TEMPS-Cyclothymic scale

The Temperament Evaluation of Memphis, Pisa, Paris and San Diego Auto-questionnaire Cyclothymic scale (TEMPS-Cyclothymic) was used to measure Cyclothymic

temperament (Akiskal & Akiskal, 2005a; Akiskal, Akiskal, Haykal, et al., 2005; Akiskal, Mendlowicz, et al., 2005). Participants completed only the 17 items of the Cyclothymic temperament scale taken from the full 110-item TEMPS-A. These items include content related to mood instability, variations in sleep, energy, self-esteem and socialization, intensity in emotions and romantic tendencies. Sample items include: item 1: "I often feel tired for no reason," item 2: "I get sudden shifts in mood and energy," item 12: "I feel all emotions intensely," item 17: "I am the sort of person who falls in and out of love easily." Response format is YES/NO, and items are summed to give a total score. High scores on the TEMPS-Cyclothymic scale reflect a lifetime dominance of mood instability and a probable Cyclothymic temperament.

The TEMPS-A has demonstrated good reliability and internal consistency, and the unitary factorial structure of the TEMPS-Cyclothymic scale has been upheld. Cronbach's α for the TEMPS-Cyclothymic scale have been found consistently high (ranging from .80 to .91; Akiskal, Akiskal, Haykal, et al., 2005; Akiskal, Mendlowicz, et al., 2005; Rozsa et al., 2008). Concurrent validity has also been demonstrated with the NEO Personality Inventory and the Tridimensional Personality Questionnaire (Maremmani et al., 2005; Rozsa et al., 2008). Appendix D contains the TEMPS-Cyclothymic scale.

### 7.5 Experiences in Close Relationships-Revised (ECR-R)

The Experiences in Close Relationships-Revised Scale (ECR-R) was used to measure anxious and avoidant attachment dimensions (Fraley et al., 2000). The ECR-R is based on a two-dimensional model of attachment and consists of two 18-item subscales that measure the extent an individual has an 'anxious attachment' (ECR-anxious) or an 'avoidant attachment' (ECR- avoidant). Example anxious attachment items include, item 3: "I often worry that my partner will not want to stay with me," item 22: "My desire to be very close sometimes scares people away," item 30: "My partner only seems to notice me when I'm angry." Example

avoidant attachment items include, item 28: "I am nervous when partners get too close to me," item 34: "I don't feel comfortable opening up to romantic partners," item 36: "I get uncomfortable when a romantic partner wants to be very close." Participants are instructed to indicate how they 'generally' experience relationships, not just what is happening in a current relationship. Responses on the ECR-R are on a 7-point Likert scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*), such that higher scores are associated with higher endorsement of the construct. Several items are reversed keyed and are recoded before calculating scale scores (see Appendix E).

Both the anxious and avoidant subscales have demonstrated high internal reliabilities typically exceeding Cronbach's $\alpha = .90$ (Fairchild & Finney, 2006; Sibley, Fischer, & Liu, 2005; Sibley & Liu, 2004; Tsagarakis, Kafetsios, & Stalikas, 2007). Further, repeated measures of the ECR-R over a three-week (Tsagarakis et al., 2007) and a six-week (Sibley & Liu, 2004) period have shown high temporal stability in both scales. Overall, the ECR-R is a well-established tool that has demonstrated good psychometric properties in both clinical and nonclinical samples (Ehrenthal, Dinger, Lamla, Funken, & Schauenburg, 2009; Ehrenthal, Dinger, Lamla, & Schauenburg, 2007; Fernandez-Fuertes, Orgaz, Fuertes, & Carcedo, 2011; Kooiman, Klaassens, van Heloma Lugt, & Kamperman, 2013; Olsson, Sorebo, & Dahl, 2010; Tsagarakis et al., 2007; Wongpakaran, Wongpakaran, & Wannarit, 2011). The ECR-R is also commonly used cross-culturally in nonclinical populations and is relatively quick, simple and easy to administer. Appendix E contains the ECR-R and provides information on how each item was scored.

### 7.6 Relationship Assessment Scale (RAS)

The Relationship Assessment Scale (RAS) was used to measure the subjective evaluation of positivity and satisfaction in a relationship (Hendrick et al., 1998). Research utilising the RAS is sparse. However, it was favoured over alternative relationship

satisfaction measures such as the Locke-Wallace Marital Adjustment Test (LMWAT; Locke & Wallace, 1959), the Dyadic Adjustment Scale (DAS; Spanier, 1976) or the Marital Satisfaction Inventory (MSI; Snyder, 1979) for several reasons. Firstly, in comparison to the lengthy measures noted above, the RAS is a brief seven-item measure designed to specifically measure levels of relationship satisfaction (Hendrick, 1988; Hendrick et al., 1998). The RAS is also useful in targeting couples 'at risk' for relationship disturbance (Hendrick, 1988).

The RAS appears a valid tool for assessment of general relationship satisfaction that has broad utility for researchers who are trying to assess relationship satisfaction (Hendrick et al., 1998). Indeed, being single is increasingly common across life stages (at least in Western societies) (Girme, Overall, Faingataa, & Sibley, 2016). Furthermore, the growing rates of divorce and separation also mean that more individuals are single later in life (Rosand, Slinning, Roysamb, & Tambs, 2014; Symoens, Colman, & Bracke, 2014). As being divorced, separated and/or single affects a large proportion of the general population, the inclusion of people who are not currently in a relationship offers a more universal approach to relationship satisfaction.

Therefore, for the purpose of the current study, a decision was made to not only include participants in a relationship (at the time of study participation), but to also investigate relationship satisfaction in participants who were (at the time of study participation) single, separated, divorced or widowed. It was assumed that people identifying as single have never married or are not in any kind of relationship at the time of study completion. Inclusion criterion for the study included the requirement that all participants must have experienced at least one committed relationship. Therefore, it was assumed that

participants who identify as not currently in a relationship score the RAS based on a past relationship.[1]

The seven items of the RAS tap several relationship dimensions (e.g., love, problems, and expectations). Examples of items include, item 1: "How well does your partner meet your needs?" item 2: "In general, how satisfied are you with your relationship?" and item 7: "How many problems are there in your relationship?" Responses on the RAS are on a 5-point Likert scale with 3 representing the *average* score. Items are summed to give a total score. Two items (item 4 and item 7) are negatively worded and were recoded for the current analysis. After recoding of reversed-scored items, relationship satisfaction scores range from 7 to 35 where higher scores are indicative of greater levels of relationship satisfaction.

A limited number of studies generally suggest that the RAS has adequate psychometric properties. Hendrick (1988) investigated the psychometric properties of the RAS in two samples of university students who were defined as "in love." The RAS demonstrated good internal reliability with an alpha coefficient of .86 (Hendrick, 1988). Vaughn and Baier (1999) investigated the reliability of the RAS in a German clinical sample of 55 men and 63 women who presented for therapy at a family-therapy training clinic. An alpha coefficient of .91 was found in that study. The RAS has also demonstrated good test-retest reliability (.85) and consistent measurement properties across samples of ethnically-diverse and age-diverse couples, as well as partners seeking marital and family therapy (Hendrick et al., 1998).

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[1] To alleviate any concerns about the use of the RAS in this group, additional analyses will be conducted limited to participants in a relationship ($n$ = 283: married, in a committed or casual relationship: see Appendix L).

Some evidence of construct validity has been established using correlational analyses with measures of associated constructs. The correlation between the RAS and the longer DAS was extremely high (.80; Hendrick, 1988). The RAS was found to effectively discriminate between dating couples who stayed together and those who broke up several months later (Hendrick, 1988). A strong correlation between the RAS and the DAS was also found by Vaughn and Baier (1999).

In sum, the RAS is a brief measure that demonstrates adequate psychometric properties to support its use in the present project. Appendix F contains the RAS and information on how each item was scored.

### 7.7 General Behaviour Inventory-20-item short version (sGBI)

The General Behaviour Inventory-short version (sGBI) was used to measure hypomania proneness (GBI-hypomania) and depression proneness (GBI-depression) (Poulios, Murray & Bullock, 2010). In its complete 73-item form, the GBI has been subjected to many validation studies with both clinical and nonclinical populations and has performed well at detecting proneness to clinical levels of hypomania and depression (Danielson, Youngstrom, Findling, & Calabrese, 2003; Depue et al., 1989; Depue et al., 1981; Mallon, Klein, Bornstein, & Slater, 1986; Reichart et al., 2005). The complete GBI has also been validated in undergraduates (Depue et al., 1989) and outpatient (Klein, Dickstein, Taylor, & Harding, 1989) populations, achieving sensitivity of .76 and, specificity of .98 or greater in those two studies. It has also demonstrated adequate internal consistency with Cronbach's $\alpha$ = .94 and test-retest reliability (.73) over a fifteen-week period (Depue et al., 1989).

In the current study, participants completed a shortened 20-item version of the GBI (sGBI: Poulios, Murray & Bullock, 2010). This shortened adaptation of the full-version also contains two subscales: GBI-hypomania (ten items) and GBI-depression (ten items). Sample sGBI items include, item 1: "Have there been long periods in your life when you felt sad,

depressed, or irritable most of the time?" (GBI-depression), item 11: "Have you had periods when it seemed that the future was hopeless and things could not improve?" (GBI-depression) or item 16: "Have there been periods when, although you were feeling unusually happy and intensely energetic, almost everything got on your nerves and made you irritable and angry (other than related to your menstrual cycle)?" (GBI-hypomania).

As in the full GBI, participants are asked to indicate the extent to which the statement accurately describes them. This is achieved by rating the duration and frequency of symptoms on a 4-point scale that ranges from 1 (*never or hardly ever*), 2 (*sometimes*), 3 (*often*) to 4 (*very often or almost constantly*). Items that were rated as '1' or '2' were considered to be 'absent.' Items scored as a '3' or a '4' were considered to be 'present' and contributed to the overall score (Poulios, Murray & Bullock, 2010). Higher trait levels of GBI-hypomania and GBI-depression are indicative of a greater level of trait vulnerability to BD.

The sGBI was created to address the length of the original instrument and provide a clearer two-dimensional structure. An exploratory factor analysis with a 2-factor solution identified the highest loading 10 "hypomania" and "depression" items from the original 73-item instrument. The psychometric properties of the sGBI were compared with the full-length GBI in a nonclinical sample. Statistical analyses found that the new shortened subscales correlated highly with their respective subscale in the full-length version. Good internal consistency ($\alpha = .93$) was also found (Poulios, Murray & Bullock, 2010). Thus, the sGBI was included in the present study to measure a two-dimensional perspective of Cyclothymic temperament. Appendix G contains the sGBI.

### 7.8 Cyclothymic Relationship Scale (CRS)

A distinct secondary aim of the study was to take the first steps in developing a valid self-report measure of Cyclothymic moodiness, insecure attachment and relationship satisfaction. The rationale for development of this new instrument, named the Cyclothymic

Relationship Scale (CRS), was that, if the primary prediction here was supported, the field could move forward more rapidly with a purpose-built scale that captures problematic relationship styles in BD. It is important to note that the CRS was not used in the core hypothesis-testing here; hypotheses were tested using commonly used and well-validated measures. A number of scales were reviewed to help develop potential items: the Hypomania Checklist (HCL-32; Angst et al., 2005), the Affective Lability Scales (ALS; Oliver & Simons, 2004) and the Experiences in Close Relationships-Revised Scale (ECR-R; Fraley et al., 2000). The use of these measures was predominantly used to obtain ideas about how best to design a user friendly self-report measure. For instance, how to construct a Likert scale, how to number items etc. The context of the new scale was developed entirely from self-help texts focusing on managing moodiness in relationships.

The outcome was a 13-item self-assessment measure designed to sample adequately three domains: cognitive (three items), emotional (five items) and behavioural (five items) of cyclothymic moodiness that may co-occur within the context of a close relationship. The scale uses a five point Likert-rating scale from 1 (*very inaccurate*) to 5 (*very accurate*). Low scores represent lower levels of cyclothymic moodiness within the context of a close relationship and high scores represent higher levels of cyclothymic moodiness within the context of a close relationship. Example items, item 1: “I alternate between perceiving my relationship as both disastrous and perfectly ideal” (cognitive), or item 3: “I get easily annoyed, snappy and irritated with my partner and then quickly feel admiration, love and affection” (emotional), or item 7: “I alternate between wanting to be close to my partner and then I distance myself from them altogether” (behavioural).

The CRS was not piloted before its use in the present study. In the present sample, internal consistency was excellent, with a Cronbach’s $\alpha = .90$. Appendix H contains the CRS and provides information on how each item is scored.

### 7.9 Satisfaction with Life Scale (SWLS)

The Satisfaction with Life Scale (SWLS) was used to measure global satisfaction with life (Diener et al., 1985). The SWLS is a brief five-item measure of life satisfaction rated on a seven point Likert scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). The SWLS includes, item 1: "In most ways, my life is close to my ideal," item 3: "I am satisfied with life" and, item 5: "If I could live my life over, I would change almost nothing." Higher scores on the SWLS indicate increased levels of global life satisfaction. The possible range of scores are 5 (low satisfaction) to 35 (high satisfaction). Mean life satisfaction scales across samples tend to range from 23 to 28, representing 'slightly satisfied' to 'satisfied' levels of life satisfaction. The five items are all keyed in a positive direction and scores are added to arrive at a total score for the scale (Pavot & Diener, 2008).

The SWLS is a commonly used self-report measure that does not assess satisfaction with distinct life domains such as health or finances but rather is based on the notion that an individual can generate an overall cognitive appraisal of their life satisfaction. This appraisal is believed to require a comparison by individuals between the current status of their lives, and self-defined expectations regarding what they would like their lives to be (Pavot & Diener, 1993; Pavot & Diener, 2008; Pavot & Diener, 2009).

The SWLS has been used in numerous studies and has demonstrated strong internal reliability and appropriate temporal stability. For example, in the initial validation study, Diener and colleagues (1985) found an alpha coefficient equalling .87 for 176 undergraduates at the University of Illinois. Similarly, these researchers found two-month test-retest correlation coefficients equal to .82 for 76 students re-tested from their original sample. Findings from a further six studies demonstrated alpha coefficients ranging from .79 to .89 (Pavot & Diener, 1993). More recently, a meta-analysis found that the mean coefficient alpha

across 62 studies using the SWLS was .78 with values that ranged from .57 to .95 (Vassar, 2008).

The SWLS is highly correlated with other measures of life satisfaction, e.g., the Life Satisfaction Index-A (LSI-A) and demonstrates consistency across a variety of age groups (Pavot & Diener, 2009; Pavot, Diener, Colvin, & Sandvik, 1991). A number of factor analytic studies have supported a unitary factor structure of the SWLS across a variety of populations and cultural contexts, a feature not available with other life satisfaction measures (Pavot & Diener, 2008; Pavot & Diener, 2009; Pavot et al., 1991). Appendix I contains the SWLS and provides information on how each item was scored.

### 7.10 Mood Disorder Questionnaire (MDQ)

The Mood Disorder Questionnaire (MDQ) was included to identify and exclude people with a BD diagnosis. The MDQ is a brief self-report screen for the presence of bipolar spectrum disorders (Hirschfeld et al., 2000) and contains five sections. Section 1 asks about a lifetime history of manic or hypomanic syndromes and includes 13 yes/no items (derived from both DSM criteria and clinical experience). All of the 13 statements begin with the statement "Has there ever been a period in your life when you were not your usual self and…" This statement is followed by thirteen items that assess various bipolar symptoms. These include, hypersexuality, e.g., "..you were much more interested in sex than usual?" racing thoughts "..thoughts raced through your head or you couldn't slow your mind down?" and irritability " ..you were so irritable that you shouted at people or started fights and arguments." The 13-items are summed to yield an overall score.

Section 2 asks the question "If you checked YES to more than one of the above, have several of these ever happened during the same period of time?" This section is only completed by participants who score >1 of the 13-items outlined in section one. A 'yes' response is indicative of greater bipolar risk. In section 3, participants evaluate psychosocial

problems associated with their symptoms, e.g., unable to work, family, money or legal problems, getting into fights and arguments? Participants choose from 1 (*no problem*) to 4 (*serious problem*). Moderate to serious responses are indicative of greater bipolar risk. In section 4, participants are asked whether any of their blood relatives have had bipolar disorder (i.e., children, siblings, parents, grandparents, aunts, uncles). Finally in section 5, participants are asked whether they have ever been told by a health professional that they have BD.

A positive screen requires that seven or more items from section one be endorsed, that at least several of the items co-occurred, and that the symptoms caused at least moderate psychosocial impairment. By using this 7-or-more-item threshold, studies have shown that seven out of ten people with a bipolar spectrum disorder are identified, whereas nine out of 10 of those who did not have a bipolar spectrum disorder would be successfully screened out (Frey, Simpson, Wright, & Steiner, 2012; Hirschfeld et al., 2000; Waleeprakhon et al., 2014; Wang et al., 2015).

The MDQ exhibits good psychometric properties in relation to sensitivity and specificity in adult psychiatric samples (see Zimmerman & Galione, 2011, for a review) but these are poorer in general population samples (Goldney, Fisher, Grande, Taylor, & Hawthorne, 2005; Hirschfeld, Calabrese, et al., 2003; Hirschfeld, Holzer, et al., 2003). Initially validated in a psychiatric outpatient population, the MDQ yielded good sensitivity (.73) and very good specificity (.90) scores (Hirschfeld et al., 2000). Other studies based on the scoring guidelines suggested by Hirschfeld et al. (2000) have found the sensitivity of the scale has ranged from 0% (Chung, Tso, & Chung, 2009) to 91.4% (Tafalla, Sanchez-Moreno, Diez, & Vieta, 2009) and its specificity has ranged from 47% (Isometsa et al., 2003) to 97.2% (Hirschfeld, Holzer, et al., 2003). Several studies have found that the MDQ yields better sensitivity for BD-I than for BD-II (Gervasoni et al., 2009; Miller, Klugman, Berv,

Rosenquist, & Ghaemi, 2004; Twiss, Jones, & Anderson, 2008). Zimmerman and Galione (2011) also found that the MDQ's sensitivity was higher in detecting BD-I than BD-II (66.3% vs. 38.6%) in the general population. In a French version of the MDQ, a sample of 96 BD outpatients completed the MDQ before being interviewed with the SCID. A standard cut-off score of 7 or more symptoms correctly screened out 90.5% (specificity) of individuals not meeting the SCID criteria for lifetime bipolar spectrum disorders. Sensitivity proved to be excellent for BD-I (90.3%) but weaker for BD-II (52.4%) (Rouget et al., 2005).

Appendix J contains the MDQ, and information on how each item was scored. The MDQ and scoring information is also available at www.dbsalliance.org/pdfs/MDQ.pdf.

### 7.11 Procedure

The study received ethics approval from the Swinburne University Human Research Ethics Committee (SUHREC), see Appendix K. The anonymous web-based survey was developed using the Opinio software package (ObjectPlanet, Oslo, Norway). Recruitment occurred via online links (including postings on mood disorder websites and social network sites). Social networking enabled the researcher to utilise a snowball sampling technique. The web links transferred interested participants to the start of the survey described as 'Temperament and Close Relationships.' Prospective participants were firstly presented with a Participant Information Statement (see Appendix B). This included the title of the project and the overall general nature and purpose of the project. Potential risks associated with participation were described as minimal, however, contact details to a low-cost counselling service were provided in the unlikely event that distress did arise. Additional contact details of the primary researcher and SUHREC were also provided. Participants were fully informed that their responses would remain completely anonymous and confidential as no identifying information was required. Completion of the online survey indicated their consent to participate in the project. It was emphasised that participants were free to withdraw from the

project at any time. All elements of the survey were only available in English and participants were free to complete the online survey at a time and place that suited them. It was anticipated that the survey would take approximately twenty to thirty minutes to complete. For participants who were interrupted, wished to return to the survey later, or complete it in stages, the option to save the data with a password of their choice was given. Participants who wished to proceed with the survey went on to complete the demographic information and battery of measures described above.

### 7.12 Statistical Methods

Data were entered into the Statistical Package for Social Sciences (SPSS) Version 18.0 for Windows. Significance was set at $p < .05$ level, with two-tailed tests used for all analyses. The raw data were initially screened for missing data, out of range or implausible values and outliers using graphical methods. These included frequency tables, box plots, stem-and-leaf plots, histograms, a P-P (probability-probability) plot and Q-Q (quantile-quantile) plot. Two data entry errors values were found and corrected. A variety of measures of central tendency and dispersion such as the mean, 95% confidence interval for mean and the standard deviation were computed. Kline (2005) suggests that scores more than three standard deviations above the mean may be considered a univariate outlier. Mahalanobis distances were calculated to screen for multivariate outliers (see section 8.1.2.1). Internal consistency for all measures was assessed against the criterion of Cronbach's $\alpha > .7$ (Cronbach, 1951; Tabachnik & Fidell, 2007).

As some statistical procedures (e.g., ANOVA & SEM) require a normal distribution of the variables to be analysed, skewness and kurtosis were examined (see section 8.1.2.2). The W statistic of the Shapiro-Wilk test is reported to be the most powerful normality test available and is able to detect small departures of non-normality over a wide range of distributions (Shapiro, Wilk, & Chen, 1968). Skewness and kurtosis in samples over 200

should not unduly affect the analysis (Tabachnick & Fidell, 2007) but based on the recommendations of Tabachnik and Fidell, (2007), a decision was made to transform key variables to a more normal distribution. Histograms were used to assess the suitability of a specific transformation. If square (negative skew) or square root (positive skew) transformations did not yield the intended results, a natural log or inverse function was applied.

Pearson's correlations were first performed to investigate correlations between all of the study scales (see Table 3). Cohen's (1988) standard was used to evaluate all correlation coefficients to determine the strength of the relationship, or the effect size. Coefficients between .10 and .29 represented a weak or small association, coefficients between .30 and .49 represented a moderate association, and coefficients above .50 represented strong or large associations. A one-way ANOVA was conducted to evaluate the association between relationship status and relationship satisfaction. Significant results were examined using the *post hoc* Tukey's test.

In order to evaluate the psychometric properties of the 13-item Cyclothymic Relationship Scale (CRS), internal consistency was assessed with Cronbach's α for each subscale (cognitive, emotional and behavioural) and for the total CRS. The factor structure of the CRS was assessed using Principal Axis Factoring-PAF with a direct oblimin rotation. An oblimin rotation was deemed most appropriate as it permits the rotated components to be correlated with one another (Fabrigar, Wegener, MacCallum, & Strahan, 1999; Yong & Pearce, 2013). In addition, oblimin rotation simplifies the factor structure by minimising cross-loading (Tabachnick & Fidell, 2007). Sample size typically influences how high a loading needs to be in order to render interpretation of the component in a significant way. A rotated factor loading for a sample size of at least 300 would need to be at least .32 to be considered statistically meaningful (Tabachnick & Fidell, 2007). A cross-loading is when an

item loads at .32 or higher on two or more factors (Costello & Osborne, 2005). Commonalities should also be greater than .30 (MacCallum, Widaman, Preacher, & Hong, 2001; MacCallum, Widaman, Zhang, & Hong, 1999).

Three criteria for factor retention were used in the current study. Firstly, a factor was required to contain at least three items loading above the cut-off of .32 (i.e., items with a loading of .32 or greater). Secondly, Kaiser's (1960) eigenvalue-greater-than-one rule was used. Thirdly, to determine the number of factors to retain, examination of Cattell's (1966) scree plot was also used.

### 7.12.1 Path analysis.

Finally, primary mediational questions of the study were investigated using path analysis. Path analysis is one of the techniques also known as Structural Equation Modelling (SEM). In the context of mediational analyses, there are many advantages to using the SEM framework over standard regression methods such as those initially recommended by Baron and Kenny (1986). SEM analysis provides model fit information about the hypothesised mediational model to the data and evidence for the plausibility of the causality assumptions (Ullman, 2006). SEM can also be used when extending a mediation process to multiple independent variables, mediators or outcomes and, is argued to be more statistically powerful than standard regression procedures (Gunzler, Chen, Wu, & Zhang, 2013).

SEM also seeks to represent complex hypotheses about the interrelationships among a set of substantively meaningful variables (Byrne, 2001) and, unlike univariate techniques in which the examination of variables is limited, SEM is a multivariate technique that takes a confirmatory rather than an exploratory approach to data analysis (Kline, 2005). Path analysis underlies much of the rationale behind current structural modelling and is used to examine directional relationships between measured variables (Ullman, 2006). It is generally accepted

that a sample size greater than 200 is required to obtain reliable weight matrices (Kline, 2005).

Diagrams are fundamental to SEM as they allow the researcher to diagram the hypothesised set of relations that comprise the model (Ullman, 2006). All measured observable exogenous variables (independent variables) are represented by rectangles. Error terms represent residual variances within variables not accounted for by pathways in the model. To account for measurement error, all endogenous variables (dependent or mediating variables) have a unique residual term associated with them. Direct relationships between variables are indicated with a line with one arrow, and a line with an arrow at both ends indicates correlation between the two variables. Absence of an arrow connecting variables implies lack of a hypothesised direct effect. An assessment of how well the observed data fit to the model is one of the primary goals in the application of SEM. When the estimation procedure used in SEM has converged to a reasonable solution, the model fit determines the degree to which the structural model fits the sample data (Kline, 2005).

To assess the goodness of fit with the data, tests of the three theorized structural models were conducted using the Analysis of Moment Structures (AMOS) version 18 (Arbuckle & Wothke, 1995). This analysis uses the maximum likelihood (ML) estimation method to examine the overall fit of the model. ML performs reasonably well under a variety of less than optimal statistical conditions (e.g., small sample size and excessive kurtosis) (Tabachnick & Fidell, 2007). A basic assumption underlying the use of SEM with ML estimation method is that the observations are drawn from a continuous and multivariate normal population. In other words, the estimates obtained will be normal, unbiased and efficient (Iacobucci, 2010).

***Model Fit Indices.*** Evaluating the fit of a path model is a complex process due to the range of available indices, all of which reflect different aspects of model fit. To facilitate

decision making, aspects of sample size, power and the complexity of the model were considered (Boomsma, 2000). The overall fit of the path model was determined by several absolute and incremental goodness-of-fit indices that are recommended by Hu and Bentler (1999). A second form of parsimony fit index is those that are commonly known as 'information criteria' indices. Probably the best known of these indices is the Akaike Information Criterion (AIC). Based on these guidelines the following six indices were chosen. Acceptable models needed to meet all of the following six criteria.

***Model chi-square ($\chi^2$)***: The chi-square ($\chi^2$) test statistic has an associated significance test while all other measures are descriptive. The $\chi^2$ statistic is the traditional measure for evaluating overall model fit and was used to test the hypothesis that the fit between the predicted model and the data is not significantly worse than the fit between a saturated model and the data. A good model fit is indicated by an insignificant result ($p > .05$) (Barrett, 2007).

***Normed chi-square ($\chi^2$ /df)***: Absolute fit indices include the normed chi-square ($\chi^2$ /df). Absolute fit indices evaluate the degree to which the specified model reproduces the sample data. As the chi-square ($\chi^2$) test is sensitive to sample size, the $\chi^2$ /df is commonly reported. The $\chi^2$ /df can adjust or account for the influence of sample size on the model chi square. Although there is no consensus regarding an acceptable ratio for the $\chi^2$ /df, Tabachnick and Fidell (2007) suggest a good-fitting model is when the ratio of the $\chi^2$ to the degrees of freedom is less than 2.

***The Root Mean Square Error of Approximation (RMSEA)*:** Absolute fit indices also include the root mean square error of approximation (RMSEA). The RMSEA focuses on the model's estimated population fit. Values larger than .10 are indicative of poor fitting models, whilst values in the range of .05 to .08 indicate fair fit (Browne & Cudek, 1992). Hu and Bentler (1999) suggested an RMSEA value closer to .06 as a cut-off criterion. In addition, the lower and upper bounds of the 90% confidence interval (CI) may also be reported. The lower

left boundary of the CI should contain zero for exact fit and be < .05 for close fit (Kline, 2005).

***The Tucker-Lewis Index (TLI)***: The incremental fit indices are a group of indices that compare the chi-square value to a more restricted, nested baseline model. For these models the null hypothesis is that all the observed variables are uncorrelated (Hu & Bentler, 1998, 1999). Two commonly used incremental fit indices are the Tucker-Lewis index (TLI) and the Comparative fit index (CFI). The Tucker-Lewis Index (TLI) is similar to the RMSEA in that it is also used to compare the proposed model against the null model, and measures the extent to which observed covariance are due to common factors (Tucker & Lewis, 1973). A rule of thumb for this index is that values close to .95 indicate good fit (Hu & Bentler, 1999).

***The Comparative Fit Index (CFI)***: The Comparative Fit Index (CFI) is largely unaffected by sample size and performs well even with a small sample size (Tabachnick & Fidell, 2007). This index assumes that all latent variables are uncorrelated (null model) and assesses the improvement of fit of the researcher's model compared with this null model. The CFI ranges from zero to one with higher values indicating better fit. A cut-off criterion > .95 is indicative of good-fit (Hu & Bentler, 1999).

***The Akaike Information Criterion (AIC):*** This fit indices is generally used when comparing saturated models (models with 0 degrees of freedom) to non-saturated models, estimated with the same data and indicates to the researcher which of the models is the most parsimonious. Smaller values suggests a good fitting, parsimonious model (Akaike, 1974; Hu & Bentler, 1999).

# Chapter Eight: Results

## 8.0 Overview of Chapter Eight

This chapter is divided into five main sections. The first section describes the initial process of screening the data for missing data and violations of assumptions, deviations from normality, skewness and kurtosis, internal reliability, and multicollinearity. This section also presents data on internal reliabilities for all of the quantitative scales and the descriptive statistics (section 8.1). In the second section, initial correlational analyses are presented (section 8.2). Then, in section three, the results of three structural models using path analysis are presented. These are the key analyses addressing mediation by insecure attachment, from a one dimensional (Cyclothymic temperament), two-dimensional (hypomania and depression proneness) and a nested perspective (section 8.3). In section four, the external correlates of the RAS are presented (section 8.4). Finally, in section five, investigations of the psychometric validation of the CRS are also investigated (section 8.5).To recap, the development of the CRS is purely exploratory, and if the present mediation hypotheses were confirmed, could be used in future research to explore the process or interaction between Cyclothymic temperament – insecure attachment - relationship satisfaction in more depth.

## 8.1 Data screening

### *8.1.1 Missing data.*

Data were initially examined for missing data and data entry errors. A total of 695 participants commenced the survey. Missing values analysis revealed a total of 296 cases with substantial missing data (> 75% missing data). There were two major sources of missing data: participants who did not move beyond the Participant Information Statement or the demographic page, and participants who discontinued the survey after approximately 5-10 items. For these 296 participants, as no independent or dependent measures were completed, no total scores could be attributed. A list-wise deletion approach was utilised to eliminate

these observations from further analyses, leaving a total of 399 cases. Missing value analyses of remaining data indicated that the data were missing completely at random. Missing data was limited to the relationship status variable ($n$ = 2 missing data). Surveys with a small number of remaining missing data points (< 5%) were not judged to be problematic and were retained for analyses. No missing data was found for any of the variables included in the SEM models.

Further inspection of the data set showed that 16 participants did not fit the survey criteria: 14 participants reported they had never experienced a committed relationship and 2 participants did not fit the age criterion (one participant was aged 17 and another aged 68 years). In addition, a further 23 cases were removed on the grounds that a current BD diagnosis was deduced from the MDQ. A total of 39 invalid cases were therefore removed, leaving a total of 360 cases for analyses.

### 8.1.2 Testing for Violations of Normality.

#### *8.1.2.1 Outliers.*

Several cases of upper and lower extreme outliers were detected on TEMPS-Cyclothymic Scale, GBI-depression, GBI-hypomania, RAS, CRS, ECR-anxious, ECR-avoidant and the SWLS. A comparison of the 5% trimmed means with the means for each of the measures revealed that the outliers had minimal influence on any of the mean values. With Mahalanobis distances, $\chi^2$ (12) = 32.91 ($p$ < .001), 10 cases exceeded the critical value. Each outlying case was evaluated individually. One multivariate outlier showed a configuration of scores that were unusual and was removed from the analysis. Although the nine remaining participants demonstrated extreme scores, they appeared to be entered correctly and nothing unusual for the psychometric measures was found. These nine cases were retained for analyses, leaving 359 valid cases to be included in hypothesis testing.

#### *8.1.2.2 Skewness and kurtosis.*

Violations of normality were observed on all scales. Inspection of the histograms demonstrated that the TEMPS-Cyclothymic, CRS, ECR-anxious and ECR-avoidant were moderately positively skewed and within the region of acceptance (viz., the skewness is positive and less than or equal to 1; Tabachnick & Fidell, 2007). GBI-depression and the GBI-hypomania were highly positively skewed (greater than 1). Moderate negative skewness was found for both the RAS and SWLS measures, but they were also within the region of acceptance. Nevertheless, in order to meet the univariate normality assumption of the ANOVA and the multivariate normality assumption of the SEM procedure, a decision was made to conduct transformations for all of the scales in order to produce an approximately normally distributed score. A natural log transformation was applied to the primary predictor variable TEMPS-Cyclothymic. A natural log was also applied to the CRS scale. An inverse function was applied to the GBI-hypomania and GBI-depression subscales. A square root was applied to ECR-anxious and ECR-avoidant (mediating variables) and a square was applied to the RAS (dependent variable) and SWLS. The transformed data improved distributions and was used for all analyses.

#### *8.1.2.3 Multicollinearity.*

Multicollinearity occurs when two or more variables are so highly correlated that they appear to be measuring the same construct. Multicollinearity of the predictor variables was assessed by checking the Pearson's correlation matrix (see Table 3). Tabachnick and Fidell (2007) recommend that careful consideration is required before including two variables with a bivariate correlation of .70. No correlations met this criterion.

### 8.1.3 Recoding of items.

Multiple groups were combined and recoded. Thirty three countries were recorded for 'country of birth'. Australia was the most frequently reported country of birth. Therefore, Australia was coded with the value 1. Predominantly English speaking countries, i.e., Canada, Ireland, New Zealand, South Africa, UK and USA were all coded as 2. All predominantly non-English speaking countries, i.e., Brazil, Brunei, China, Colombia, Croatia, Denmark, Germany, Greece, Hong Kong, India, Kenya, Malaysia, Mexico, Netherlands, Papua New Guinea, Philippines, Poland, Romania, Singapore, Spain, South Korea, Sri Lanka, Switzerland, Taiwan, Turkey, Zimbabwe were all coded as 3. Fourteen countries were recorded for 'country currently living'. Australia was again the most frequently reported country of birth and again coded with the value 1. Predominantly English speaking countries were coded as 2 and included: Canada, Hawaii, New Zealand, UK and USA. Predominantly non-English speaking countries, i.e., Brazil, Hong Kong, India, Malaysia, Netherlands, Philippines, Singapore and Thailand were all coded as 3.

### 8.1.4 Scale reliability.

Reliability coefficients (Cronbach's alpha) were calculated for all of the study scales and are presented in Table 2, along with the means and standard deviations.

### 8.1.5 Descriptive statistics.

Table 1

*Descriptive Statistics for Demographic Variables*

| | *n* | Total (*N*=359) |
|---|---|---|
| GENDER | | |
| Male | 69 | 19.2% |
| Female | 290 | 80.8% |
| HIGHEST LEVEL OF EDUCATION | | |
| Postgraduate | 155 | 43.2% |
| Primary | 2 | 0.6% |
| Secondary | 82 | 22.8% |
| Tertiary | 120 | 33.4% |
| SEXUAL ORIENTATION | | |
| Heterosexual | 331 | 92.2% |
| Homosexual | 14 | 3.9% |
| Bisexual | 14 | 3.9% |
| RELATIONSHIP STATUS | | |
| Never married in current committed relationship | 123 | 34.5% |
| Married | 120 | 33.6% |
| Single | 51 | 14.3% |
| Previously married in current committed relationship | 24 | 6.7% |
| Divorced | 14 | 3.9% |
| Separated | 9 | 2.5% |
| Never married in current casual relationship | 9 | 2.5% |
| Previously married in current casual relationship | 3 | 0.8% |
| Widowed | 2 | 0.6% |
| Other | 2 | 0.6% |
| Age – Mean (*SD*) | | 34.78 (12.33) |

Table 2 shows the means, standard deviations and scale reliability alphas (α) for all study scales. As shown, all scales demonstrated very good internal reliability (> .86). Scale distributions in the current sample were comparable to distributions in previous published research (Akiskal, Akiskal, Haykal, et al., 2005; Depue et al., 1989; Diener et al., 1985; Eckblad & Chapman, 1986; Fairchild & Finney, 2006; Harnic et al., 2014; Hendrick, 1988; Henry & Crawford, 2005; Hirschfeld et al., 2000; Lang et al., 2016; Pavot & Diener, 1993; Poulios, Murray & Bullock, 2010). The new CRS demonstrated excellent internal reliability α = .90.

Table 2

*Means, Standard Deviations and Scale Reliability Alphas for all Study Scales, including Means and Standard Deviations for Ability to Maintain a Relationship and Relationship Duration*

| Scale | N = 359 | *M* | *Mdn* | *SD* | Skewness | Kurtosis | α |
|---|---|---|---|---|---|---|---|
| TEMPS-Cyclothymic | | 5.14 | 4.00 | 4.38 | .85 | .01 | .87 |
| GBI-depression | | 17.84 | 16.00 | 6.70 | 1.23 | 1.36 | .95 |
| GBI-hypomania | | 12.07 | 10.00 | 4.55 | 2.30 | 6.26 | .92 |
| RAS | | 27.45 | 29.00 | 6.35 | -.82 | .00 | .91 |
| CRS | | 29.15 | 28.00 | 11.06 | .39 | -.53 | .90 |
| ECR-anxious | | 3.14 | 3.11 | 1.11 | .45 | -.36 | .94 |
| ECR-avoidant | | 2.62 | 2.42 | .99 | .62 | -.26 | .93 |
| SWLS | | 21.19 | 23.00 | 5.62 | -.85 | .02 | .89 |
| Ability to maintain | N = 359 | 3.73 | | .97 | | | |
| Duration | N = 357 | 6.12 | | 8.39 | | | |

*Note.* TEMPS-Cyclothymic = Temperament Evaluation of Memphis, Pisa, Paris and San Diego Auto-questionnaire (Cyclothymic temperament scale); GBI-hypomania/GBI-depression = short General Behaviour Inventory; RAS = Relationship Assessment Scale; CRS = Cyclothymic Relationship Scale; ECR-anxious and ECR-avoidant = Experiences in Close Relationships-Revised; SWLS = Satisfaction with Life Scale.

*Note.* Ability to maintain range = 1 – 5, Relationship duration range = 0 – 41 years.

## 8.2 Preliminary Correlational Analyses: Trait Vulnerability to BD, Insecure Attachment Dimensions and Relationship Satisfaction

Bivariate correlations between the study's scales are provided in Table 3. As predicted in H2, a significant negative correlation between the TEMPS-Cyclothymic scale and the RAS was found.

Table 3

*Correlations Between Scales*

| Scale | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| 1. TEMPS-Cyclothymic | - | .56** | .55** | -.27** | .52** | .30** | .44** | -.42** |
| 2. GBI-depression | | - | .50** | -.34** | .38** | .30** | .55** | -.57** |
| 3. GBI-hypomania | | | - | -.26** | .40** | .23** | .38** | -.27** |
| 4. RAS | | | | - | -.47** | -.64** | -.54** | .47** |
| 5. CRS | | | | | - | .44** | .56** | -.27** |
| 6. ECR- anxious | | | | | | - | .51** | -.37** |
| 7. ECR- avoidant | | | | | | | - | -.45** |
| 8. SWLS | | | | | | | | - |

*Note.* TEMPS-Cyclothymic = Temperament Evaluation of Memphis, Pisa, Paris and San Diego Auto-questionnaire (Cyclothymic temperament scale); GBI-hypomania/GBI-depression = short General Behaviour Inventory; RAS = Relationship Assessment Scale; CRS = Cyclothymic Relationship Scale; ECR-anxious and ECR-avoidant = Experiences in Close Relationships-Revised; SWLS = Satisfaction with Life Scale.

* $N = 359$, * $p < .05$, ** $p < .01$,*** $p < .001$.

Bivariate correlations also showed expected significant positive correlations between the TEMPS-Cyclothymic scale and the ECR-anxious (H2a) and ECR-avoidant (H2b) subscales (Table 3). A moderate positive correlation was found between the TEMPS-Cyclothymic Scale and the ECR-avoidant subscale, while a more modest positive correlation between the TEMPS-Cyclothymic scale and the ECR-anxious subscale was found.

As expected, the TEMPS-Cyclothymic scale was strongly and positively correlated with both the GBI-hypomania (H2c) and GBI-depression subscales (H2d). As predicted, the GBI-hypomania showed a negative correlation with the RAS (H2e). The GBI-hypomania subscale was significantly and positively correlated with both the ECR-anxious (H2f) and the ECR-avoidant subscales (H2g). A more modest correlation was found between the GBI-hypomania and the ECR-anxious subscale (.23) than between the GBI-hypomania and ECR-avoidant subscale (.38).

Comparable to the GBI-hypomania subscale, the GBI-depression subscale also showed a negative correlation with the RAS (H2h). As expected, the correlations between the GBI-depression and ECR-anxious (H2i) and ECR-avoidant subscales (H2j) were also positive and significant. Like the GBI-hypomania subscale, the GBI-depression subscale also showed a more modest association with ECR-anxious (.30), and a stronger positive correlation with the GBI-depression and ECR-avoidant subscale (.55).

## 8.3 SEM models: Hypothesis and aims testing

### 8.3.1 Starting Model 1 and Final Path Model 1 – One dimensional mediation model.

Structural equation modelling was used to test whether anxious and avoidant attachment mediated the relationship between Cyclothymic temperament and relationship satisfaction[2]. Analyses began with a starting model, shown in figures 3, 5 and 7, then, to obtain the best fitting model, step-wise deletion of non-significant pathways and refit was conducted until all of the remaining pathways were significant. Theoretically, the ECR-anxious and ECR-avoidant are deemed separate but related dimensions, therefore, to further improve final model fit, a theoretically justified correlation of errors was included between the ECR-anxious and ECR-avoidant subscales. Compared to the starting models, a smaller AIC value was observed in the final models, suggesting the final models were more parsimonious.

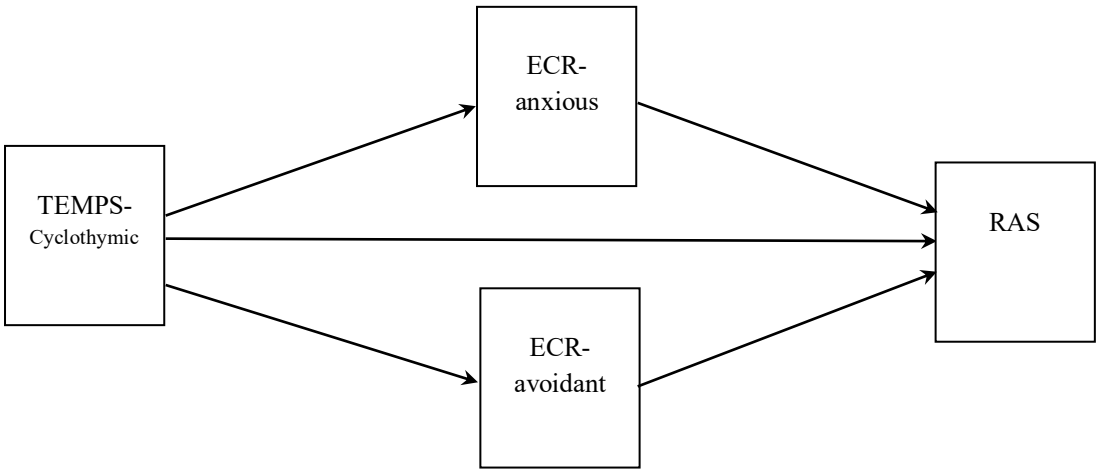


*Figure 3.* Proposed one-dimensional mediation model.

[2] To enhance the studies argument that insecure attachment mediates the association between TEMPS-Cyclothymic and the RAS, two additional exploratory moderating models were tested. All generated poor model fit (see Appendix M).

The initial starting model shown above in Figure 3, generated poor fit indices $\chi^2$ (1, *N*= 359) = 78.46, *p* = .00, CMIN/DF = .007, RMSEA = .46, TLI = -.46, CFI = .81, AIC = 104.46 and so was revised as proposed by the non-significant pathways (and modification indices), with deletion of non-significant pathways. The modified model (Final Path Model 1) shown in Figure 4 was good fit to the data, $\chi^2$ (1, *N*= 359) = .007, *p* = .93, CMIN/DF = .007, RMSEA = .00, TLI = 1.00, CFI = 1.00., AIC = 26.00. The standardised and unstandardised coefficients for this model are shown below.

Table 4

*Unstandardised, Standardised, and Significance Levels for Final Model 1 in Figure 4 (Standard Errors in Parentheses; N = 359)*

| *Pathways* | *Unstandardised* | *Standardised* | *p* |
|---|---|---|---|
| Structural Model | | | |
| TEMPS-Cyclothymic → ECR-anxious | .47 (.07) | .30 | < .001 |
| TEMPS-Cyclothymic → ECR-avoidant | .70 (.07) | .45 | < .001 |
| ECR-anxious → RAS | -122.122 (10.96) | -.49 | < .001 |
| ECR-avoidant→ RAS | -70.27 (10.63) | -.29 | < .001 |
| Correlations | | | |
| e1 < > e2 | .44 | | |

*Note.* TEMPS-Cyclothymic = Temperament Evaluation of Memphis, Pisa, Paris and San Diego Auto-questionnaire (Cyclothymic temperament scale); ECR-anxious and ECR-avoidant = Experiences in Close Relationships-Revised; RAS = Relationship Assessment Scale.

$p < .05$, $p < .01$, $p < .001$

The hypotheses that the relationship between Cyclothymic temperament and relationship satisfaction would be mediated by anxious attachment (H1) and avoidant attachment (H1a), were strongly supported. The mediation model containing the TEMPS-Cyclothymic explained 48% of the variance in the primary outcome (RAS). In addition, the path weight between the TEMPS-Cyclothymic scale and the ECR-avoidant subscale was stronger than between the TEMPS-Cyclothymic scale and the ECR-anxious subscale. Notably, ECR-anxious had a greater negative effect on the RAS than the ECR-avoidant subscale.

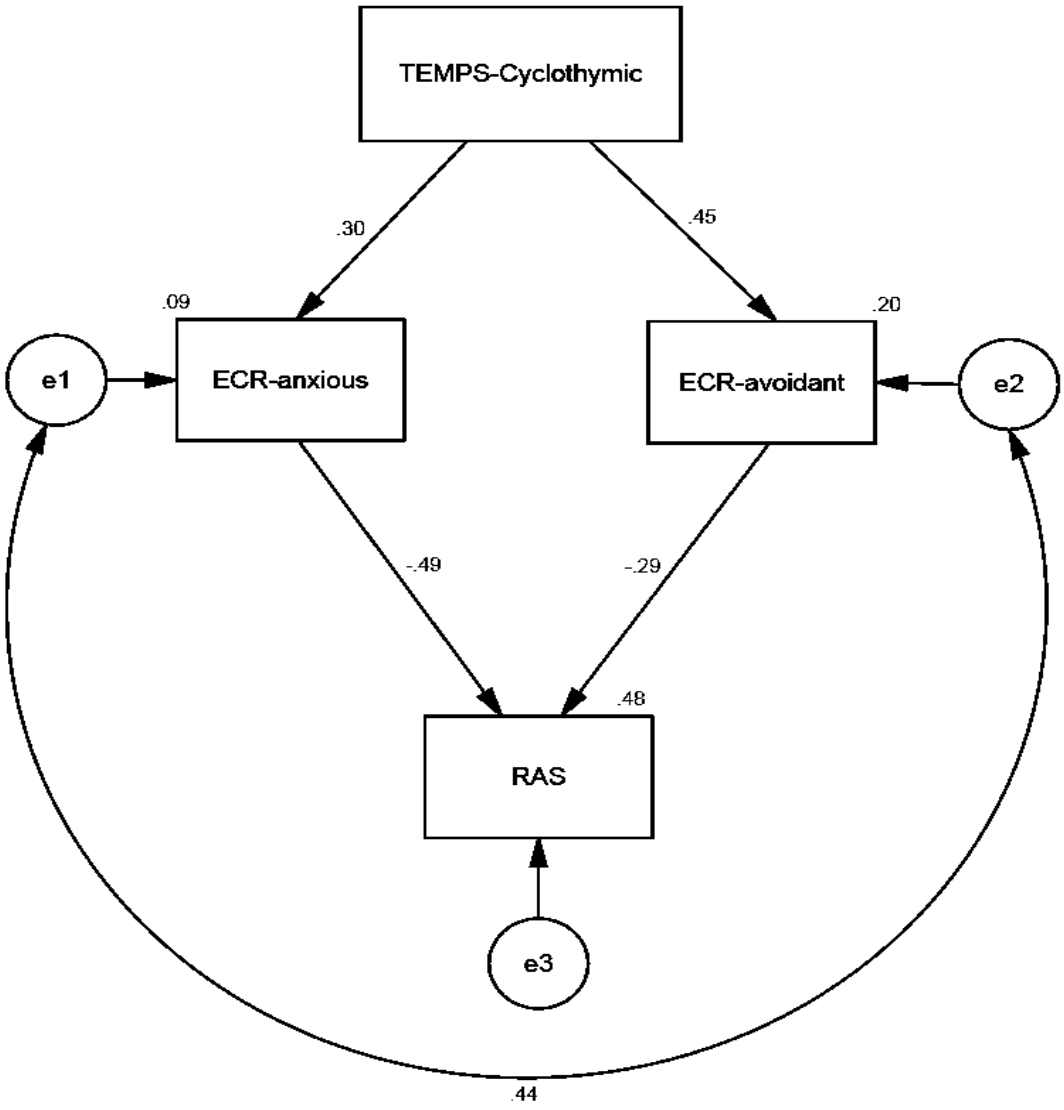


*Figure 4.* Path Model 1: Final model of theorised mediation effect between Cyclothymic temperament and relationship satisfaction.

### 8.3.2 Starting Model 2 and Final Path Model 2 - Two-dimensional mediation model.

Next, having established a mediation model with Cyclothymic temperament as the predictor variable, a second proposed starting model was tested that aimed to explore the relative importance of hypomania versus depression proneness. TEMPS-Cyclothymic was therefore replaced with GBI-hypomania and GBI-depression as shown below.

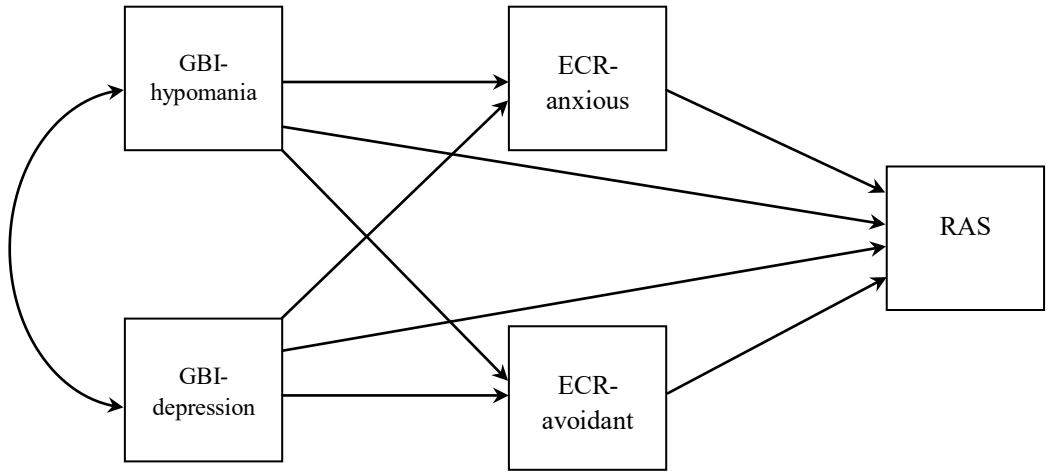


*Figure 5.* Proposed two-dimensional mediation model.

The initial starting model shown above in Figure 5, generated poor fit indices $\chi^2$ (1, *N*= 359) = 72.27, *p* = .00, CMIN/DF = .72.27, RMSEA = .44, TLI = -.23, CFI = .87, AIC = 110.27. Examination of the significance tests of pathweight and modification indices demonstrated that neither the GBI-hypomania (-.03) nor GBI-depression (-.03) subscales had a direct effect on the RAS. Based on the hypothesised mediating effects of insecure attachment, the structural paths between GBI-hypomania and GBI-depression subscales and the RAS were therefore removed. The model was resubmitted without these direct pathways. Again, a theoretically justified correlation of errors between the ECR-anxious and ECR-avoidant subscales was also included. The modified model (Final Path Model 2) shown in

Figure 6 was a good fit to the data, $\chi^2$ (2, *N*= 359) = 1.34, *p* = .51, CMIN/DF = .67, RMSEA = .00, TLI = 1.00, CFI = 1.00, AIC = 37.34.

Table 5

*Unstandardised, Standardised, and Significance Levels for Final Model 2 in Figure 6 (Standard Errors in Parentheses; N = 359)*

| *Pathways* | *Unstandardised* | *Standardised* | *p* |
|---|---|---|---|
| Structural Model | | | |
| GBI-depression → ECR-anxious | 16.13 (3.77) | .25 | < .001 |
| GBI-depression → ECR-avoidant | 32.55 (3.39) | .48 | < .001 |
| GBI-hypomania →ECR-anxious | 6.61 (3.34) | .11 | .048 |
| GBI-hypomania →ECR-avoidant | 8.20 (3.00) | .14 | .006 |
| ECR-anxious → RAS | -122.12 (10.96) | -.49 | < .001 |
| ECR-avoidant→ RAS | -70.27 (10.63) | -.29 | < .001 |
| Correlations | | | |
| GBI-depression < > GBI-hypomania | .50 | | |
| e1 < > e2 | .43 | | |

*Note.* GBI-hypomania/GBI-depression = short General Behaviour Inventory; RAS = Relationship Assessment Scale; ECR-anxious and ECR-avoidant = Experiences in Close Relationships-Revised.

$p < .05$, $p < .01$, $p < .001$

Final Path Model 2 suggests that neither hypomania nor depression proneness had a direct effect on relationship satisfaction. As anticipated, insecure attachment fully mediated the relationship between a two-dimensional approach to Cyclothymic temperament and levels of relationship satisfaction. A direct pathway was found between GBI-depression and both the ECR-anxious and ECR-avoidant subscales. However, as shown in Table 5, the path coefficient from GBI-depression to the ECR-avoidant subscale was stronger than from GBI-depression to ECR-anxious subscale.

Notably, the relationship between hypomania proneness and the anxious and avoidant dimensions were weak. Thus, the effect of GBI-hypomania on insecure attachment was only marginally significant for both ECR-anxious and ECR-avoidant subscales, suggesting that these weak direct associations should be removed. When the model was rerun without these two weak pathways, a good fit to the data was achieved**,** $\chi^2$ (4, *N*= 359) = 9.52, *p* = .049, CMIN/DF = 2.38, however, the AIC increased to 41.52 and the RMSEA decreased to .06, the TLI decreased to .97 and the CFI decreased to .99, indicating a significant deterioration in fit ($\chi^2 \Delta$ = 9.52 - 1.34 = 8.18 with *df* = 4-2 = 2, *p* = .017). For this reason, these two weak pathways were retained in the model.

The size of the direct pathways between both the ECR-anxious and the ECR-avoidant subscales and the RAS was the same as that shown in the Final Path Model 1. Thus, again the ECR-anxious subscale had a stronger negative effect on the RAS than the ECR-avoidant dimension. Final Path Model 2 also explained 48% of the variance in the RAS. A comparison of Final Model 1 with Final Model 2 indicted no significant difference in model fit – ($\chi^2$ = 1.34 - .007 = 1.33, difference for *df* = 2-1 = 1, *p* = .248).

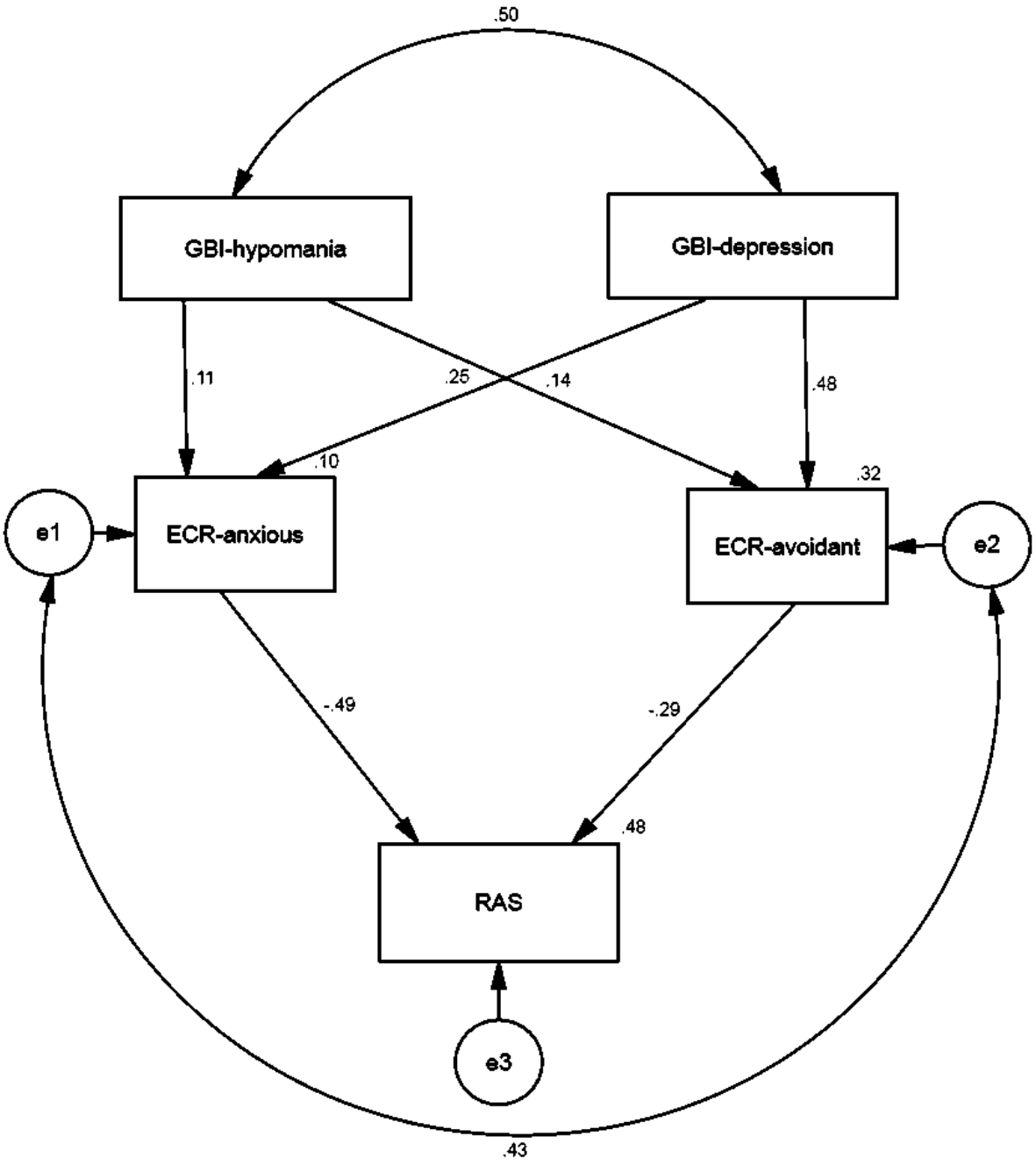


*Figure 6.* Path Model 2: Final model of theorised mediation effect between hypomania and depression proneness and relationship satisfaction.

### 8.3.3 Starting Model 3 and Final Path Model 3 - Nested mediation model.

Having established a mediation model with hypomania and depression proneness (8.3.2) and a one-dimensional model with Cyclothymic temperament (8.3.1), for completeness a third nested mediation model was tested. This third model aimed to capture the construct of Cyclothymic temperament from a one-dimensional and two-dimensional perspective. As shown in Figure 7, TEMPS-Cyclothymic was therefore modelled as arising from two putative constituent dimensions (GBI-hypomania and GBI-depression).

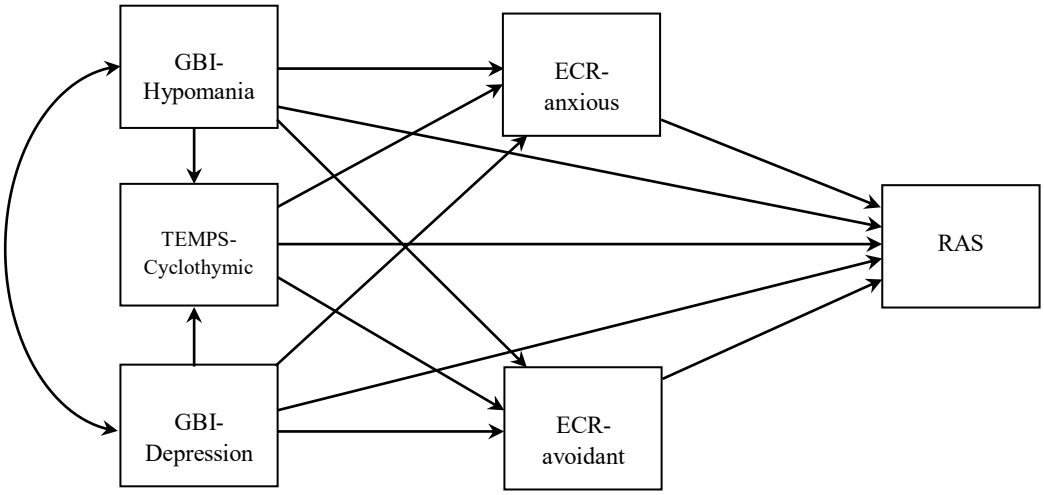


*Figure 7.* Proposed nested mediation model.

Again, path analysis began with a starting model. The initial theorised model shown above in Figure 7, generated poor fit indices $\chi^2$ (1, *N*= 359) = 67.69, *p* = .00, CMIN/DF = .67.69, RMSEA = .43, TLI = -.28, CFI = .91, AIC = 119.69. To obtain a better fitting alternative, the direct paths from TEMPS-Cyclothymic to the RAS and from GBI-hypomania and GBI-depression to the RAS were removed. After these modifications were made the model was rerun. The modified model was a good fit to the data, $\chi^2$ (3, *N*= 359) = 2.04, *p* = .56, CMIN/DF = .68; RMSEA = .00; TLI = 1.00; CFI = 1.00; AIC = 50.04. However, the structural pathways between the GBI-hypomania and the ECR-anxious (.05) and ECR-avoidant subscales (.08) were not significant. On the basis of the non-significant path co-

efficients, a decision was made to rerun the model without the direct pathways from GBI-hypomania to the ECR-anxious and ECR-avoidant subscales. Removing these two non-significant pathways generated a model fit ($\chi^2\Delta = 4.22 - 2.04 = 2.18$, $df = 5 - 3 = 2$, $p = .34$) that was found to be a good fit to the data, $\chi^2 (5, N = 359) = 4.22$, $p = .51$, CMIN/DF = .84, RMSEA = .00, TLI = 1.00, CFI = 1.00, AIC = 48.22. Therefore, a decision was made to remove these pathways and the Final Path Model 3 is shown in Figure 8.

Table 6

*Unstandardised, Standardised, and Significance Levels for Final Model 3 in Figure 8 (Standard Errors in Parentheses; N = 359)*

| *Pathways* | *Unstandardised* | *Standardised* | *p* |
|---|---|---|---|
| Structural Model | | | |
| GBI-hypomania → TEMPS-Cyclothymic | 13.66 (1.76) | .36 | < .001 |
| GBI-depression → TEMPS-Cyclothymic | 16.49 (1.99) | .39 | < .001 |
| GBI-depression →ECR-anxious | 12.66 (3.93) | .19 | .001 |
| GBI-depression → ECR-avoidant | 29.74 (3.53) | .44 | < .001 |
| TEMPS-Cyclothymic →ECR-anxious | .29 (.09) | .20 | .001 |
| TEMPS-Cyclothymic → ECR-avoidant | .30 (.08) | .20 | .001 |
| ECR-anxious → RAS | -122.12 (10.96) | -.49 | < .001 |
| ECR-avoidant→ RAS | -70.27 (10.63) | -.29 | < .001 |
| Correlations | | | |
| GBI-hypomania < > GBI-depression | .50 | | |
| e2 < > e3 | .42 | | |

*Note.* TEMPS-Cyclothymic = Temperament Evaluation of Memphis, Pisa, Paris and San Diego Auto-questionnaire (Cyclothymic temperament scale); GBI-hypomania/GBI-depression = short General Behaviour Inventory; RAS = Relationship Assessment Scale; ECR-anxious and ECR-avoidant = Experiences in Close Relationships-Revised.

$p < .05$, $p < .01$, $p < .001$

The Final Path Model 3 (see Figure 8) showed that both the GBI-hypomania and GBI-depression had a moderate direct effect on the TEMPS-Cyclothymic scale. In turn, the TEMPS-Cyclothymic scale had a direct effect on both the ECR-anxious and ECR-avoidant subscales (each explained 20% of the variance). Notably, when Cyclothymic temperament

was separated out into its two putative constituent parts (hypomania and depression proneness), the results suggest that depression proneness had a strong and predictive association with the avoidant attachment dimension, and a weaker association with the anxious attachment dimension. Hypomania proneness had no direct effect on either of the insecure attachment dimensions. This finding was in contrast to the direct effect of hypomania proneness on insecure attachment established in Final Model 2. Rather, Final Model 3 suggests that hypomania proneness is indirectly associated with both the anxious and avoidant attachment dimensions through its associations with Cyclothymic temperament and depression proneness.

Furthermore, anxious attachment was the primary predictor of lower relationship satisfaction; while the avoidant attachment dimension had a weaker negative effect on relationship satisfaction. Although a comparison across models was not the aim of the current study per se, model comparisons were conducted for completeness. No significant difference in model fit was found between Final Model 1 and Final Model 3 – ($\chi^2$ = 4.22 - .007 = 4.21, difference for *df* = 5-1 = 4, *p* = .621). Similarly, a comparison of Final Model 2 with Final Model 3 also found no significant difference between these models – ($\chi^2$ = 4.22 - .1.34 = 2.88, difference for *df* = 5-2 = 3, *p* = .589). All three models explained 48% of the variance.

The data presented here suggest that a nested model of Cyclothymic temperament also fit the data well. The Final path Model 3 suggests that both anxious and avoidant attachment dimensions mediated the relationship in a model that combined the one-dimensional and two-dimensional assumption of Model 1 and Model 2 respectively.

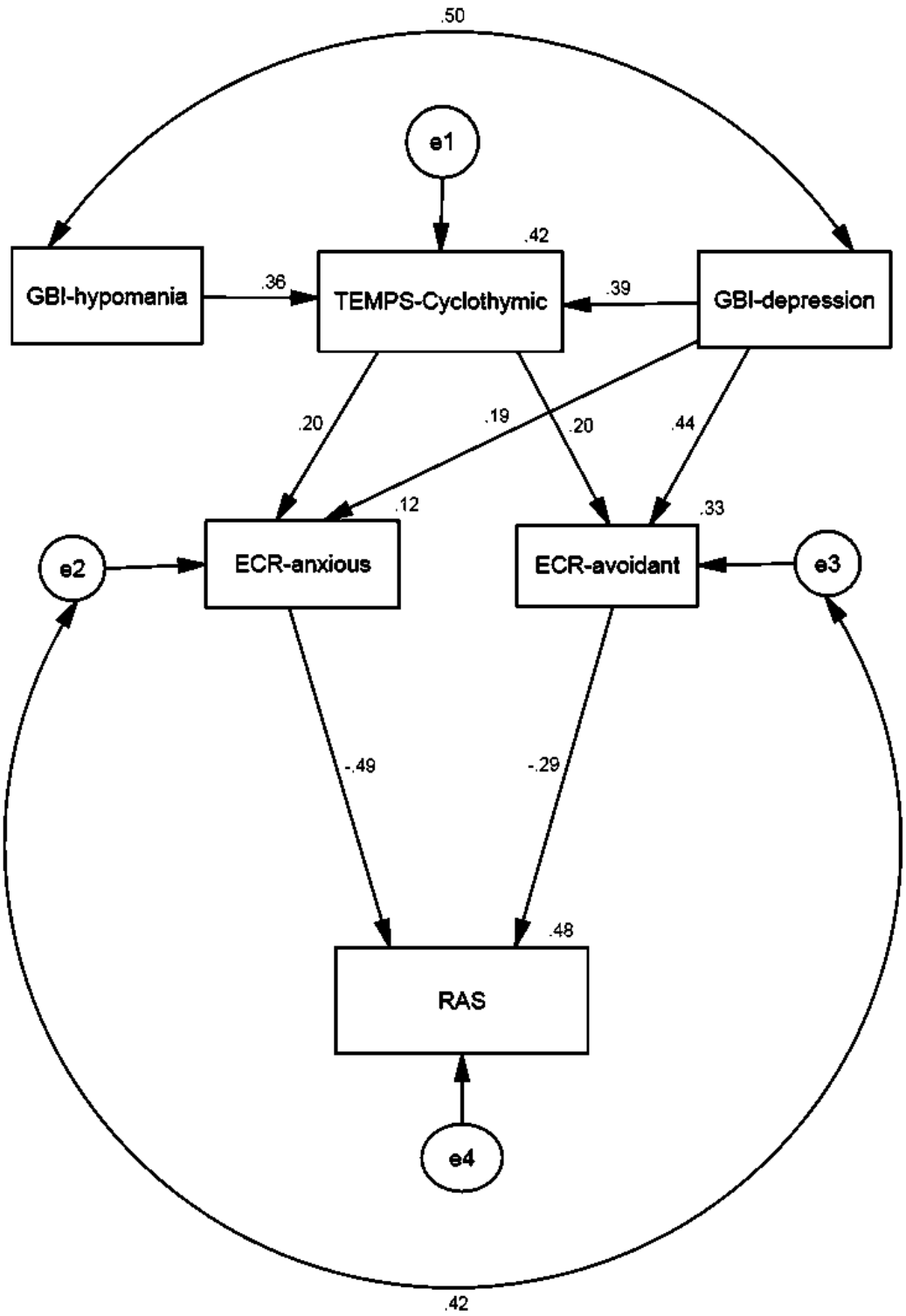


*Figure 8:* Path Model 3: Final model of theorised mediation effect between Cyclothymic temperament, hypomania and depression proneness and relationship satisfaction.

In sum, the current findings indicate that all three structural models fit the data. Thus, regardless of the theoretical conceptualisation of Cyclothymic temperament, a mediating effect was found. Furthermore, a two-dimensional and nested model of Cyclothymic temperament aimed to offer a more complete picture of the associations between trait vulnerability to BD, insecure attachment and relationship satisfaction. When Cyclothymic temperament was modelled as arising from two putative constituent dimensions (GBI-hypomania and GBI-depression), the findings suggest that depression proneness and the avoidant attachment dimensions are closely linked. The results also indicate that hypomania proneness is weakly linked to both of the anxious and avoidant attachment dimensions. It seems, that hypomania proneness is indirectly associated with insecure attachment through associations with Cyclothymic temperament and depression proneness.

### 8.4 Validation of the RAS

Prior to SEM analyses, exploration of the RAS and its relationship with external correlates was conducted. As predicted in H3, results of the one way ANOVA suggested a statistically significant difference in RAS scores between people of different relationship statuses [$F$ (9,347) = 13.39, $p$ = .005].

Table 7

*Summary of ANOVA for RAS and Relationship Status*

| | Sum of Squares | *df* | Mean Square | *F* | Sig |
|---|---|---|---|---|---|
| Between Groups | 3707.19 | 9 | 411.91 | 13.39 | .005 |
| Within Groups | 10671.93 | 347 | 30.75 | | |
| Total | 14379.13 | 356 | | | |

* $N$ = 357, * $p$ < .005, **$p$ < .01,*** $p$ < .001.

Post hoc analyses were conducted given the statistically significant ANOVA $F$ test. Specifically, Tukey HSD tests were conducted on all possible pairwise contrasts. The following pairs of groups were found to be significantly different at $p$ < .05: married participants scored higher on the RAS ($M$ = 29.26, $SD$ = 5.04) than single participants ($M$ = 22.43, $SD$ = 5.75). Married participants also scored higher on the RAS than separated ($M$ = 17.00, $SD$ = 3.93) and divorced participants ($M$ = 22.36, $SD$ = 5.69). Those previously married and in a current committed relationship also scored higher on the RAS ($M$ = 28.46, $SD$ = 5.86) than single ($M$ = 22.43, $SD$ = 5.75), separated ($M$ = 17.00, $SD$ = 3.93) and divorced participants ($M$ = 22.36, $SD$ = 5.69). Furthermore, those never married and in a current committed relationship scored higher on the RAS ($M$ = 29.30, $SD$ = 5.77) than single

(*M* = 22.43, *SD* = 5.75), separated (*M* = 17.00, *SD* = 3.93) and divorced participants (*M* = 22.36, *SD* = 5.69). Taken together, these results provide some external validation of the RAS, in that married participants and those in a current committed relationship (previously married or never married) scored higher on the RAS than single, separated and divorced participants.

Table 8

*Correlations Between Ability to Maintain a Relationship, Relationship Duration, Cyclothymic Moodiness Within the Context of Relationship and Relationship Satisfaction*

| | Duration | CRS | RAS |
|---|---|---|---|
| Ability to maintain | .17** | -.31** | .48** |
| Duration | | -.10 | .13** |
| CRS | | | -.47** |

*Note.* CRS = Cyclothymic Relationship Scale, RAS = Relationship Assessment Scale.

* $p < .05$, ** $p < .01$,*** $p < .001$

As shown in Table 8, the strongest correlations were between the RAS and a) the CRS and b) the single item measure of ability to maintain a relationship. As expected, a negative correlation between the RAS and the CRS was found (H3d), while a positive correlation between the ability to maintain a relationship and the RAS was found (H3a). Furthermore, relationship duration and RAS scores were positively correlated (H3b). Finally, as shown in Table 3, and as expected, a positive moderate correlation between the RAS and the SWLS was found (H3c).

In sum, the patterns of bivariate correlations suggest that the RAS is a valid instrument for the present purposes.

## 8.5 Psychometric Validation of the CRS

### 8.5.1 Factor structure of the CRS.

An exploratory factor analysis was used to examine the theoretical three factor structure of the CRS. Using the pattern matrix for interpretation, all of the items but one correlated at least .3 with at least one other item, suggesting reasonable factorability. Item 5 demonstrated weaker correlations but was retained as an important aspect of the content domain on theoretical grounds. Secondly, the Kaiser-Meyer-Olkin measure of sample adequacy was 0.93 indicating that 93% of variance in the measured variables was common variance. In addition, Bartlett's test of Sphericity was significant ($\sim\chi^2$ (78) = 2445.39, $p < 0.05$), indicating that there were correlated relationships between the items. Rotated factor loadings for the 13 items are presented in Table 9. The scree plot is shown in Figure 9. The scree plot does not provide support for a three factor solution, but suggests that only the first factor was meaningful. Rather, the results suggest that the scale may better be represented by a one-factor solution. On theoretical grounds, however, a three-factor solution was explored.

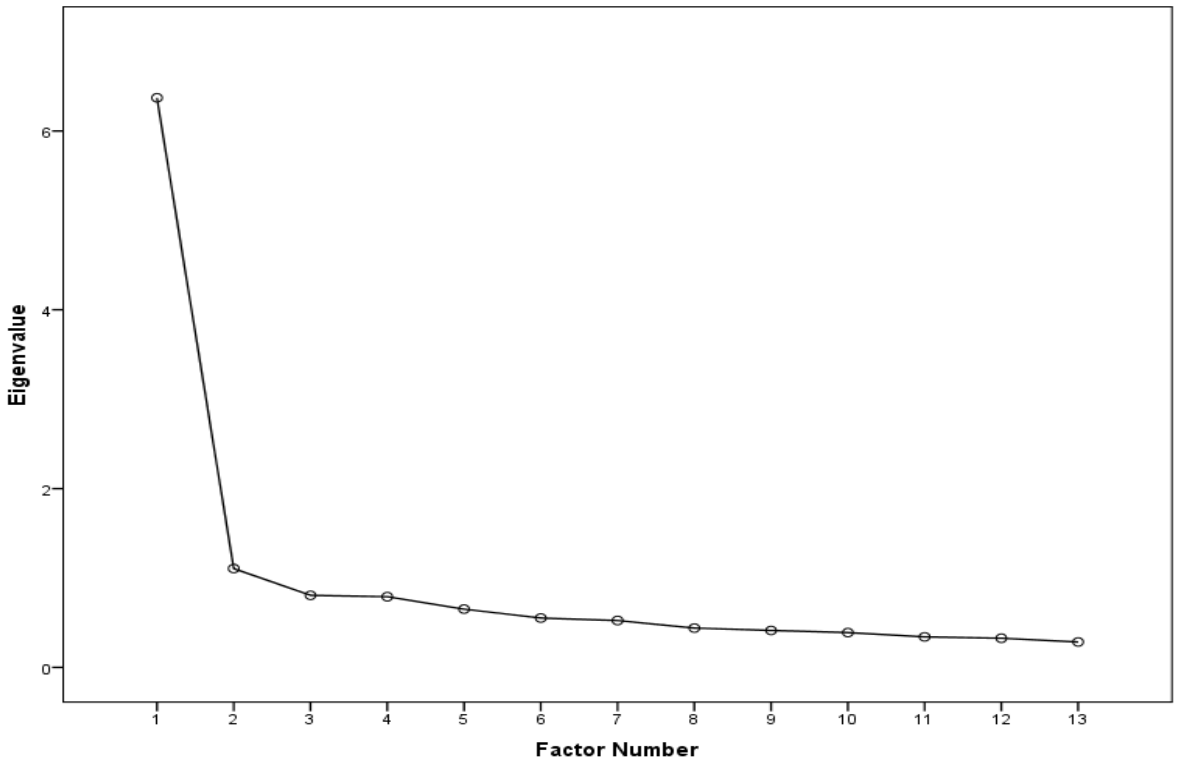


*Figure 9*. Scree plot of eigenvalues for the 13 item CRS.

Table 9

*Rotated Factor Loadings and Communalities Based on a Principal Axis Factoring for the 13 items from the Cyclothymic Relationship Scale for Overall Sample (N = 359)*

| Items | Factor | | | Communalities |
|---|---|---|---|---|
| | 1 | 2 | 3 | |
| Cognitive items | | | | |
| Item 1 | **.44** | .01 | **-.49** | .66 |
| Item 4 | **.49** | .10 | -.29 | .56 |
| Item 13 | **.40** | **.33** | -.01 | .45 |
| Emotional items | | | | |
| Item 2 | **.59** | .09 | -.18 | .58 |
| Item 3 | **.73** | -.11 | -.17 | .58 |
| Item 9 | **.38** | .28 | -.11 | .44 |
| Item 10 | .09 | **.32** | **-.50** | .57 |
| Item 11 | .00 | **.71** | .10 | .46 |
| Behavioural items | | | | |
| Item 5 | .26 | .28 | -.10 | -.11 |
| Item 6 | .08 | **.61** | -.00 | .45 |
| Item 7 | -.05 | **.70** | -.26 | .67 |
| Item 8 | **.86** | .00 | .19 | .62 |
| Item 12 | **.66** | .16 | .03 | .57 |

*Note*. Except for item 5, all factor loadings > .3

The three-factor solution accounted for 63.71% of the item variance (eigenvalues = 49.00, 8.50, 6.20). Interpretation of the pattern matrix demonstrated that cognitive, emotional and behavioural items mostly loaded on the first factor. The range of rotated factor loadings was .86 - .28. Specifically, item 3 (emotional), "I get easily annoyed, snappy and irritated with my partner, then quickly feel love and admiration" loaded heavily on the first factor (.73), so too did item 8 (behavioural), "I take things out on my partner and then quickly try to make it up to them" (.86). Other observed variables that loaded heavily on the first factor (values ranged from .44 to .66) were item 1 (cognitive), "I alternate between perceiving my relationship as both disastrous and perfectly ideal" (.44), item 4 (cognitive), "I alternate between seeing my relationship as full of joy and excitement, and then it seems dull and boring"' (.49); item 2 (emotional), "I alternate between feeling responsible for any problems in my relationship to blaming my partner for everything" (.59) and item 12 (behavioural), "I alternate between saying hurtful things to my partner and then I frequently compliment them" (.66). Item 9 (emotional), "I have loving and angry feelings for my partner at the same time" (.38) had a stronger loading on the first factor.

Two behavioural items loaded highly on the second factor: item 6, "I alternate between being very talkative with my partner and then at times I have nothing to say" (.61) and item 7, "I alternate between wanting to be close to my partner and then I distance myself from them altogether" (.70), and two emotional items: item 10, "I alternate between feeling committed to my relationship one week then want to break it off, (.32) and item 11, "I alternate between sharing my feelings with my partner in times of need and keeping my feelings to myself" (.71). Only item 1 (cognitive), "I alternate between perceiving my relationship as both disastrous and perfectly ideal" (-.49) and item 10 (emotional), "I alternate between feeling committed to my relationship one week, and then want to break it off of the next (-.50) loaded on the third factor.

One of the items did not fit this factorial structure neatly and demonstrated a cross-loading, i.e., item 13 (cognitive), "I alternate between wondering why my partner would want to be with me, and then thinking they are lucky to have me." The factor loadings of item 5 (behavioural) "I alternate between wanting sex all the time, and then don't want sex at all" loaded weakly on factor one (.26), factor two (.28) and factor three (-.10). The observation in the current study that this item loaded weakly might suggest deletion or revision of this item in any future iteration of the CRS scale. [3]*

Although the CRS scale was designed to assess three domains of Cyclothymic moodiness within the context of a close relationship (i.e., cognitive, emotional and behavioural), contrary to expectations (H4) the PAF did not support a three factor solution. Moreover, as shown in Table 9, a three factor solution showed, 8 items had primary loadings on factor 1, three on factor 2 and one on factor 3. However, as the factor structure of the CRS was better represented by a one-factor solution, the CRS will be viewed herein as a one-dimensional measure.

### 8.5.2 Internal consistency of the CRS.

As seen in Table 2 and as expected (H4a), the Cronbach's α of the CRS was acceptably high for the total scale (α = .90).

### 8.5.3 Validity of the CRS.

Table 3 reports bivariate correlations between the CRS total score and the other measures of interest. The CRS demonstrated an expected criterion correlation with the TEMPS-Cyclothymic scale. Specifically, as expected the CRS showed a strong positive

[3] In further support of this suggestion, a re-examination of the internal consistency of the CRS scale with item 5 omitted yielded a Cronbach's alpha of .90 ($N$ = 359), indicating that removal of this item did not improve the reliability of the scale.

convergent correlation with the TEMPS-Cyclothymic scale (as predicted in H4b). A strong positive correlation between the CRS and the ECR-avoidant subscale was also found (H4d), whereas the GBI-hypomania (H4e), GBI-depression (H4f) and ECR-anxious subscales (H4c) all showed moderate positive correlations. Finally, as expected, the CRS showed a significant negative correlation with the RAS (H3d) and a negative correlation with the SWLS (H4g). All correlations were significant, thus supporting hypotheses H3d and H4b – H4g.

# Chapter Nine: Discussion

## 9.0 Overview of Chapter Nine

The chapter begins with a summary of the main research findings in relation to the primary and secondary aims of the project (section 9.1). The findings are discussed in relation to other published research, and to the writers knowledge are the first address the correlations between Cyclothymic temperament, insecure attachment and relationship satisfaction from a one-dimensional (Cyclothymic temperament) and two-dimensional (hypomania and depression proneness) perspective (section 9.2). Following this, the findings from the three hypothesised structural models are discussed, illuminating the importance of insecure attachment as a mediating factor (sections 9.3 – 9.5). In addition, included in the hypothesis-testing, an investigation of external correlates of the RAS is discussed (section 9.6). Developed purely as an exploratory measure, the psychometric properties of the CRS are discussed (section 9.7). The limitations and strengths of the current project are then discussed (section 9.8). Next, the implications of the findings are considered in terms of the clinical and theoretical implications of Cyclothymic temperament, insecure attachment and relationship satisfaction, and suggestions made for future research (9.9). The chapter ends with the project's conclusions (9.10).

## 9.1 Summary of the Main Findings in Relation to the Primary and Secondary Aims of the Project

The overarching aim of the current project was to improve understanding of the relationship between Cyclothymic temperament and relationship satisfaction by investigating the potential mediating role of insecure attachment. Path analysis was conducted to test three structural models that differed in terms of how Cyclothymic temperament was modeled (one-dimensional, two-dimensional, and a nested model).

Before carrying out path analysis, bivariate associations between the key variables were investigated. Correlational results showed, as predicted, that Cyclothymic temperament was, (a) negatively correlated with relationship satisfaction, (b) positively correlated with anxious and avoidant attachment and (c) positively correlated with both hypomania and depression proneness. Furthermore, (d) hypomania and depression proneness were negatively correlated with relationship satisfaction and, (e) positively correlated with anxious and avoidant attachment.

As predicted, path analysis results indicated that anxious and avoidant attachment mediated the relationship between one-dimensional (Fig. 4) and two-dimensional (Fig. 6) models of Cyclothymic temperament and relationship satisfaction. These different assumptions about the nature of Cyclothymic temperament generated novel insights. Using two-dimensional view of Cyclothymic temperament findings indicated that hypomania and depression proneness are related but distinguishable constructs, each with different relations to anxious and avoidant attachment dimensions and levels of relationship satisfaction. An additional nested model (one-dimensional and two-dimensional modeled together) was also tested (Fig.8). As discussed below, this analyses found some novel associations between hypomania and depression proneness and their associations with anxious and avoidant attachment dimensions and relationship satisfaction.

To develop a more comprehensive understanding of factors contributing to relationship satisfaction, a further auxiliary aim was to explore external correlates of the RAS. These included: relationship status, scores on the CRS, the ability to maintain a relationship, and relationship duration. Some significant associations were found between these variables and levels of relationship satisfaction. As discussed below, a statistically significant difference in RAS scores between people of different relationship statuses was found. The results also indicated that the ability to maintain a relationship and relationship

duration were positively correlated with the RAS; while scores on the CRS were negatively correlated with the RAS. Confirming the broad significance of relationship satisfaction, these analyses suggested that increased levels of relationship satisfaction were moderately correlated with greater satisfaction with life and general well-being.

In order to advance understanding of Cyclothymic temperament and relationships satisfaction, a secondary aim (distinct from the main hypothesis driven aim reviewed above) was to develop and provide preliminary validation of a brief measure of cyclothymic moodiness within the context of a close relationship. Contrary to expectations, PAF failed to derive the theoretical three-factor structure of the CRS, suggesting the CRS is best represented by a one-factor solution. Nevertheless, the current project provides initial support for the internal consistency and external validity of the CRS, with implications for future research in this area (see below).

### 9.2 Cyclothymic temperament, Insecure Attachment Dimensions and Relationship Satisfaction: Bivariate associations

Cyclothymic temperament is typically viewed as a single dimension, most commonly measured on the TEMPS-A Cyclothymic scale (Akiskal, Akiskal, Haykal, et al., 2005; Akiskal & Mallya, 1987). As predicted in H2, initial bivariate analyses indicated that Cyclothymic temperament was negatively correlated with relationship satisfaction, this suggesting that increased levels of Cyclothymic temperament reduce relationship satisfaction. This finding is consistent with Akiskal et al. (1977), who also found Cyclothymic temperament can have an adverse effect on relationship functioning. This result also parallels clinical findings, in that relationship problems and reduced relationship satisfaction are common in diagnosed BD samples (Ballester et al., 2014; Beentjes et al., 2012; Dore & Romans, 2001).

Also, as expected, Cyclothymic temperament was positively correlated with the anxious attachment dimension (the tendency to fluctuate between a desire for intimacy, whilst at the same time displaying concern about abandonment and rejection; H2a). This finding is consistent with a recent study (Lang et al., 2016) that found positive strong correlations between Cyclothymic temperament and the anxious attachment dimension in a Hungarian university sample (Lang et al., 2016). A small number of studies similarly found positive correlations between Cyclothymic temperament and the anxious attachment dimension in people with BD (Harnic et al., 2014; MacDonald et al., 2013). This finding also resonates with some recent clinical studies that have found an overrepresentation of the anxious attachment dimension in people with BD (Harnic et al., 2014; MacDonald et al., 2013; Marazziti et al., 2007; Morriss et al., 2009) and BPD (Agrawal, Gunderson, Holmes, & Lyons-Ruth, 2004; Bouchard et al., 2009; Fonagy, Target, & Gergely, 2000; Levy, 2005; Levy, Beeney, & Temes, 2011; Levy, Meehan, Weber, Reynoso, & Clarkin, 2005; Scott, Levy, & Pincus, 2009).

The current study also demonstrated that Cyclothymic temperament was positively correlated with the avoidant attachment dimension (fears of closeness and dependency; H2b). This finding was in agreement with a clinical study by Kokcu and Kesebir, (2010) who found a positive correlation between Cyclothymic temperament and the avoidant attachment dimension among a cohort of people ($n$ = 44) diagnosed with BD. More specifically, they found that the avoidant attachment dimension was particularly exaggerated in euthymic and cyclothymic patients. With regard to the division into categorical subgroups (BD-I, BD-II, and cyclothymia), Harnic et al. (2014) also found the prevalence of the avoidant attachment dimension was greater in people with cyclothymia. On the other hand, the prevalence of the anxious attachment dimension was greater in people with BD-I and BD-II (Harnic et al., 2014). MacDonald et al. (2013) also found a positive correlation between Cyclothymic

temperament and the avoidant attachment dimension in a sample of psychiatric outpatients ($n$ = 357) with personality disorders such as those with paranoid, borderline and histrionic traits. However, in that study, a stronger correlation was found between Cyclothymic temperament and the anxious attachment dimension (MacDonald et al., 2013).

The findings from the Kokcu and Kesebir. (2010), MacDonald et al. (2013) and Harnic et al. (2014) studies suggest that there may be differences between types of BD, personality disorders, and insecure attachment. It seems that cyclothymic disorder is more closely linked to the avoidant attachment dimension, while BD-I, BD-II and personality disorders are more closely linked to the anxious attachment dimension. Although the current study was concerned with determining whether Cyclothymic temperament correlated with both anxious and avoidant attachment dimensions, a thought-provoking difference between the current findings and that of MacDonald et al. (2013) and Harnic et al. (2014) was that the current study did not find a difference in correlational strength between Cyclothymic temperament and either of the insecure attachment dimensions. That is, a moderate correlation (Cohen, 1988) was found between Cyclothymic temperament and both of the anxious ($r$ = .30) and avoidant attachment dimensions ($r$ = .44).

Like MacDonald et al. (2013) and Harnic et al. (2014), the current study employed the ECR-R to measure dimensions of insecure attachment, thus suggesting self-report measures of attachment did not explain why the current study found no difference in correlational strength between Cyclothymic temperament and insecure attachment dimensions. A more likely explanation is that associations between Cyclothymic temperament and insecure attachment dimensions differ in clinical and non-clinical samples. Thus, the current results illuminate the value of further investigation into associations between Cyclothymic temperament and insecure attachment dimensions. Future research could usefully compare Cyclothymic temperament and insecure attachment dimensions among those from nonclinical

populations (e.g., general population, student samples) versus people with different psychiatric disorders. Such research might compare associations between Cyclothymic temperament and insecure attachment in people with BD-I, BD-II, cyclothymic disorder and euthymic BD versus a healthy control sample, or it could include those with BPD and unipolar depression. Consistent with the research noted above, further examination of these different samples might reveal the relative importance of anxious versus avoidant attachment as correlates of Cyclothymic temperament. Secure attachment is likely to be found in healthy controls and those scoring low for Cyclothymic temperament. Perhaps the avoidant attachment dimension is more pronounced in euthymic BD and patients with cyclothymic disorder. Alternatively, anxious attachment might correlate more in individuals with more severe forms of BD or BPD. For instance, anxious attachment represents not only a chronic sensitivity to rejection and abandonment, but also refers to negative self-representations (Bartholomew & Horowitz, 1991). Individuals with BD-I, BD-II (Marazziti et al., 2007) and BPD (Bouchard et al., 2009; Levy, 2005; Levy, Beeney, & Temes, 2011; Levy, Meehan, Weber, Reynoso, & Clarkin, 2005; Scott, Levy, & Pincus, 2009) have also been found to exhibit a hypersensitivity to rejection and abandonment, and representations of self are severely and negatively affected. The replication of the present associations by other research groups is warranted before solid conclusions can be drawn.

### *9.2.1 Hypomania and depression proneness, insecure attachment dimensions and relationship satisfaction: Bivarate associations.*

As anticipated, correlational analyses revealed a strong positive correlation between Cyclothymic temperament and hypomania (H2c) and depression proneness (H2d). Given the sGBI and the TEMPS-Cyclothymic scales are both designed as measures of trait vulnerability to BD, this finding was expected. This finding lends further support to Murray et al. (2007)

and Quilty et al. (2009) who both found that the combination of excessive hypomanic and depressive traits can together contribute to trait vulnerability to BD.

As expected, hypomania (H2e) and depression (H2h) proneness were both negatively correlated with relationship satisfaction. Findings of the present study also found that hypomania proneness was positively correlated with both the anxious (H2f) and avoidant attachment dimensions (H2g)**.** This finding is in contrast to a recent study that found hypomania proneness is negatively correlated with both anxious and avoidant attachment dimensions in a non-clinical sample (Lang et al., 2016). Kokcu and Kesebir (2010) found no correlation between hypomania proneness and the anxious attachment dimension, and a negative correlation between hypomania proneness and the avoidant attachment dimension in a cohort of people ($n$ = 44) diagnosed with BD.

The current study also found that depression proneness was positively correlated with both the anxious (H2i) and avoidant (H2j) attachment dimensions. This finding supported Lang et al. (2016) who also found that depression proneness was positively associated with both the anxious and avoidant attachment dimensions in a non-clinical sample (Lang et al., 2016). In a sample of 44 euthymic BD patients, Kokcu and Kesebir (2010) did not find a positive correlation between depression proneness and the anxious attachment dimension. However, consistent with the current study, Kokcu and Kesebir (2010) did find a positive correlation between depression proneness and the avoidant attachment dimension.

Although the current findings were inconsistent with those of Lang et al., (2016) and Kokcu and Kesebir (2010) in terms of the associations between hypomania proneness and insecure attachment, the current study observed some distinct differences in the strength of association between hypomania and depression proneness and relationship satisfaction, and between hypomania and depression proneness and insecure attachment. For instance, using Cohen's (1988) standard, the size of the negative relationship between hypomania proneness

and relationship satisfaction was small ($r$ = - .26); whilst the correlation between depression proneness and relationship satisfaction was moderate ($r$ = - .34). Furthermore, the positive correlation between hypomania proneness and the anxious attachment dimension was small ($r$ = .23); while the correlation between hypomania proneness and the avoidant attachment dimension was greater ($r$ = .38). Alternatively, depression proneness showed a large positive correlation with avoidant attachment ($r$ = .55) and a moderate correlation with the anxious dimension ($r$ = .30). Although these findings suggest that hypomania and depression prone individuals likely score highly on both anxious and avoidant attachment, the size of the correlation is more pronounced for the avoidant attachment dimension. In particular, the correlation between depression proneness and the avoidant attachment dimension is especially robust.

An important point to remember is that these correlations essentially depend on the reliabilities of the measures. As the current study used reliable measures, a possible explanation for the smaller correlations found here between hypomania proneness and relationship satisfaction, and the smaller correlations between hypomania proneness and the anxious and avoidant attachment dimensions is that hypomania proneness is a less pronounced trait in the general population than is depression proneness (Akiskal et al., 2000; Azorin, Adida, & Belzeaux, 2015; Vazquez et al., 2008). However, the current exploration of a two-dimensional approach to Cyclothymic temperament has thrown some additional light on the relationship between trait vulnerability to BD, insecure attachment dimensions and relationship satisfaction, in that the associations between these variables may be more complex than previously thought. It seems that while hypomania and depression proneness are highly interrelated constructs, the mechanisms by which insecure attachment leads to relationship satisfaction may be different for hypomania and depression proneness. Specifically, because hypomania proneness might be linked with an increase in positive

affect and an inherent hyper-responsiveness of the BAS (Van Meter & Youngstrom, 2015), it is possible that hypomania prone individuals may interpret attachment and relationship satisfaction with greater enthusiasm and vigor. In contrast, depression proneness has been posited to involve decreased BAS activity (Van Meter & Youngstrom, 2015). Thus, depression prone individuals might hold a more negative view of attachment which in turn has a negative effect on their level of relationship satisfaction.

### 9.3 Modelling Insecure Attachment Dimensions as a Mediator between (a) Cyclothymic temperament and (b) Relationship Satisfaction

The overarching aim of the current study was to explore insecure attachment dimensions as a mediating mechanism involved in the proposed associations between Cyclothymic temperament and relationship satisfaction (H1 and H1a). The first starting model (Figure 3) tested the direct effect of Cyclothymic temperament on relationship satisfaction and the mediating effects through anxious and avoidant attachment. As predicted, Final Model 1 (Figure 4) provided evidence to suggest that anxious and avoidant attachment dimensions fully mediated the relationship between Cyclothymic temperament and relationship satisfaction. H1 and H1a were supported. Thus, the current findings provide the first empirical evidence to suggest that anxious and avoidant attachment are important mediating dimensions that help explain how Cyclothymic temperament may result in decreased relationship satisfaction.

As noted above, the current study found that insecure attachment is an underlying mechanism or process by which Cyclothymic temperament indirectly affects relationship satisfaction. Potentially, these findings are of great value in that they offer a more comprehensive understanding of how people with Cyclothymic temperament may operate in relationships. In Final Model 1 (Figure. 4), Cyclothymic temperament was moderately associated with both the anxious and avoidant attachment dimensions. This finding aligns

with a recent study that also found an association between Cyclothymic temperament and anxious and avoidant attachment dimensions in a non-clinical sample (Lang et al., 2016).

While it is normal to experience loss and rejection to some degree (particularly after the termination of a close relationship), it is possible that due to an underlying insecure attachment, sensitivity to loss and rejection is especially intense in people who score high for Cyclothymic temperament. This assumption accords with previous studies showing that the tendency to "fall in and out of love" and an interpersonal sensitivity to rejection and criticism are important features that have been linked to both Cyclothymic temperament (Akiskal et al., 1977; Akiskal et al., 1979; Akiskal et al., 1998; Placidi, Signoretta, et al., 1998) and insecure attachment (Hazan & Shaver, 1987, 2004). One way to interpret this is that people with trait vulnerability to Cyclothymic temperament may not only rapidly alternate between subclinical hypomanic and depressive moods, but they might also alternate between deactivation and hyperactivation of the attachment system. Thus, it is possible that people scoring high on Cyclothymic temperament vary between trying not to seek proximity, denying attachment needs, and avoiding closeness and interdependence in relationships, alternating with energetic attempts to achieve proximity, support, and love combined with lack of confidence that these resources will be provided, and with resentment and anger when they are not provided (Mikulincer & Shaver, 2008). Abrupt shifts in mood and the repeated reliance on hyperactivation and deactivation of the attachment system could have a significant impact on relationship satisfaction.

Based on the assumption that Cyclothymic temperament is on a bipolar spectrum with clinical BD, the results are in accordance with previous research linking BD to both the anxious (Harnic et al., 2014; MacDonald et al., 2013; Marazziti et al., 2007; Morriss et al., 2009) and avoidant attachment dimensions (Harnic et al., 2014; Kokcu & Kesebir., 2010; MacDonald et al., 2013). Thus, the current study may have implications in both nonclinical

and clinical populations. The findings suggest that insecure attachment and relationship satisfaction warrant further investigation in people with BD. Specifically, future studies may wish to investigate the models developed here, but in a large sample of people with BD to test if insecure attachment and lower relationship satisfaction can also be shown to act as mediators. Researchers might also conduct a comparative study in a sample of people with BD (50%) and matched controls (50%). The writer predicts that insecure attachment and lower levels of relationship satisfaction will be greater in people with BD than matched controls.

### 9.4 Modelling Insecure Attachment Dimensions as a Mediator between (a) Hypomania and Depression Proneness and (b) Relationship Satisfaction

Some theorists propose that trait vulnerability to BD is not best conceptualised as the unidimensional model Cyclothymic temperament, but as two separate dimensions of hypomania and depression proneness (Depue et al., 1981; 1987; Gray, 1982; Murray et al., 2007; Quilty et al., 2009). To address this understanding, a second approach was explored in which TEMPS-Cyclothymic was replaced with GBI-hypomania and GBI-depression in mediation analyses. Final Model 2 (Figure 6) suggests that hypomania and depression proneness are related, such that depression proneness positively predicted hypomania proneness, and hypomania proneness positively predicted depression proneness. This finding aligns with previous two-dimensional studies that also observed a significant positive relationship between trait vulnerability to BD and hypomania and depression proneness in a sample of nonclinical young adults (Murray, 2007; Quilty et al., 2009).

In line with Depue (1981; 1987) the current findings show that a two-dimensional model of Cyclothymic temperament may be useful in understanding the relationship between Cyclothymic temperament, insecure attachment and relationship satisfaction. For instance, in

the two-dimensional mediation starting model (Figure 5) no direct association between either hypomania or depression proneness on the one hand, and relationship satisfaction on the other were found. Final Path Model 2 (Figure 6) illustrated that anxious and avoidant attachment dimensions mediated the relationship between hypomania and depression proneness and relationship satisfaction. However, there were some distinct differences between hypomania and depression proneness and insecure attachment. For instance, the direct association between hypomania proneness and anxious and avoidant attachment dimensions were small. Depression proneness also showed a small association with the anxious dimension; however the association between depression proneness and the avoidant dimension was large.

As noted above, this patterns of findings may be because hypomania proneness is a less pronounced trait than depression proneness in the general population (Akiskal et al., 2000; Azorin, Adida, & Belzeaux, 2015; Vazquez et al., 2008). However, the current findings are consistent with two recent studies that addressed correlations between affective temperament and adult attachment. In a psychiatric outpatient sample, MacDonald et al., (2013) found small correlations between hypomanic temperament and the anxious and avoidant attachment dimensions. Alternatively, larger correlations were found between depressive temperament and both of the anxious and avoidant attachment dimensions (Macdonald et al., 2013). Similarly, in a sample of 1,469 Hungarian university students, Lang et al., (2016) found large correlations between depressive temperament and anxious and avoidant attachment dimensions. An interesting difference in the Lang et al's., (2016) study is that hypomanic temperament showed negative correlations with both of the insecure attachment dimensions, thus constituting a temperament related to secure attachment.

Interestingly, some clinical literature has assumed that attachment is significantly challenged by symptoms of mania (Morriss et al., 2009). Morris et al., (2009) separated

patients with a BD-I diagnosis into groups based on their current mood state (depressive, manic or in remission) and compared the attachment dimensions with those of healthy controls using the Bartholomew Horowitz Relationship Questionnaire (1991). This study found that attachment dimensions were strongly affected by mood state. For example, while all groups, regardless of mood state, showed a more anxious attachment than healthy controls, scores for secure attachment were no different between patients in a manic episode and healthy controls (Morriss et al., 2009). Morris et al., (2009) postulate that the grandiose view of the self during an episode of mania may contribute to self-rating of stable attachment dimension in some patients with mania. Perhaps, people with extreme hypomania proneness hold a more biased and somewhat grandiose view of attachment than those with depression proneness. This in turn, is likely to influence how they rate their close relationships. For instance, they may be more inclined to idealise their partner and overestimate their positive qualities and underestimate negative qualities, whereas people with greater depression proneness may do the opposite (Mason, O'Sullivan, Bentall, & El-Deredy, 2012; Murray, Holmes, & Griffin, 1996a, 1996b; Young, 2014). In an example of "Rose colored glasses gone too far," this is an important consideration in that extreme levels of positive emotions (like those displayed during episodes of mania) can bias emotional experience and outward perception even during the most intimate and distressing social situations (Dutra et al., 2014). Perhaps, future studies might compare the attachment and relationship experiences of people with BD-I during remission, and during a manic episode.

The current findings therefore suggest that hypomania proneness is marginally associated with insecure attachment, and that insecure attachment negatively predicts relationship satisfaction. The present study also showed significant associations between depression proneness and anxious and avoidant attachment, however, it seems that depression proneness was the most important predictor of avoidant attachment, which in turn had a

significant negative effect on relationship satisfaction. The precise processes that generate these effects are not well understood. Therefore, for completeness here, the next phase of analyses investigated a nested approach to Cyclothymic temperament.

### 9.5 Nested Mediation Model

The discussion above suggests that a two-dimensional approach to Cyclothymic temperament is useful for understanding trait vulnerability to BD, insecure attachment dimensions and relationship satisfaction. For comprehensiveness, a nested approach to Cyclothymic temperament was devised to collectively understand the relationship between a one-dimensional and two-dimensional approach to relationship satisfaction (Final Model 3, Figure 8).

Path analyses found moderate direct links between both hypomania and depression proneness and Cyclothymic temperament. An interesting finding shown in the Final Path Model 3 (Figure 8) is that hypomania and depression proneness had an almost symmetrical direct effect on Cyclothymic temperament, i.e., both hypomania and depression proneness are equally important in the prediction of Cyclothymic temperament. Not surprisingly, when hypomania and depression proneness were introduced into a nested view of Cyclothymic temperament, the pathways between Cyclothymic temperament and the anxious and avoidant attachment dimensions were smaller than those shown in Final Model 1 (Figure 4). A nested view of Cyclothymic temperament showed that Cyclothymic temperament was equally associated with the anxious and avoidant attachment dimensions ($r$ = .20). As noted above, one way to interpret this finding is that Cyclothymic temperament is directly associated with anxious and avoidant attachment because people with trait vulnerability to Cyclothymic temperament have a tendency to experience both a strong desire for closeness that fluctuates with discomfort of intimacy and dependency.

As noted above in 8.3.2, the results from Final Model 2 (Figure. 6) seem to suggest that hypomania and depression proneness are not mutually redundant concepts in this context. As shown in Final Model 3 (Figure. 8), it seems that hypomania and depression proneness can act in parallel with Cyclothymic temperament. Final Model 3 (Figure. 8) emphasised that neither the anxious nor avoidant attachment dimensions mediated the relationship between hypomania proneness and relationship satisfaction. The findings from Final Path Model 2 (Figure. 6) and Final Path Model 3 (Figure. 8) seem to suggest that hypomania proneness is less of a problem than depression proneness in terms of its effect on insecure attachment and relationship satisfaction. For instance, hypomania proneness is associated with cheerful, exuberant, grandiose, warm, people seeking traits (Akiskal & Mallya, 1987). Thus, it is possible that to some degree hypomania proneness acts as a protective buffer against insecure attachment. People with 'pure' hypomania proneness might experience negative emotions less intensely and so may be better equipped to deal with negative attachment experiences such as rejection and criticism (Simpson, Winterheld & Chen, 2006). A recent study found that hypomanic temperament was not related to insecure attachment at all, but was essentially different to the depressive and cyclothymic temperaments in that it related to secure attachment (Lang et al., 2016). This finding is worthy of further investigations, as if confirmed the findings would add further insight into the associations between hypomania proneness, insecure attachment dimensions and relationship satisfaction.

A noteworthy finding arising in Final Model 3 (Figure. 8) was the large proportion of variance in avoidant attachment (44%) explained by depression proneness. Final Model 2 (Figure. 6) also demonstrated a strong direct path between depression proneness and the avoidant attachment dimension (48%). Final Model 2 (Figure. 6) and Final Model 3 (Figure. 8) both demonstrated weaker direct paths between depression proneness and the anxious

attachment dimension. These findings are consistent with previous research that has also demonstrated that depression proneness or higher trait levels of depression are positively related to the avoidant attachment dimension (Beatson & Taryan, 2003; Bifulco, Moran, Ball, & Lillie, 2002; Morley & Moran, 2011; Murphy & Bates, 1997; Sund & Wichstrom, 2002). The current finding is also consistent with previous research on clinical and at risk populations, that similarly suggest that higher trait levels of depression is more closely associated with the avoidant attachment dimension. For instance, in a sample of clinically depressed adult patients, avoidant attachment was found to constitute a particularly vulnerable category of depression that encompasses a recurrent depressive course, poor social functioning, loneliness, and significantly less relationship satisfaction than securely attached patients (Conradi & de Jonge, 2009). A recent study carried out on a sample of individuals with unipolar depression also found an attachment pattern associated with significantly higher levels of fear in relationships and avoidance in adult romantic relationships (Bhat et al., 2014).

According to Akiskal and Mallya, (1987), depression proneness is largely associated with a tendency to pessimistic, self-critical, passive traits and the preoccupation with inadequacy, failure and negative events. In addition, people high in avoidant attachment report a lower sense of self-worth, and an overall negative view of self and negative view of others (Bartholomew & Horowitz, 1991). With regard to romantic relationships, it is possible that people prone to depression with an underlying avoidant attachment, probably express or feel less positive affect and more negative affect when engaged in close relationships (Bifulco et al., 2002). Moreover, when they perceive rejection from a potential partner or during real relationship conflicts, these individuals might express greater passive hostility by being cold and distant, refrain from showing positive or accepting behaviours such as love and support, suppress active hostility and exit the relationship (Simpson, Winterheld & Chen,

2006). Collectively, these cognitive, emotional and behavioural tendencies may lead people not only to experience less relationship satisfaction, but it could also lead to feelings of loneliness and isolation, and possibly impact on their overall general well-being.

Finally, arising in all three models, it is notable that the primary outcome variable of relationship satisfaction was more strongly associated with anxious than avoidant attachment. Thus, a strong finding in the modelling of Cyclothymic temperament from one-dimensional (Figure 4), two-dimensional (Figure 6) and a nested perspective (Figure 8) was that the anxious attachment dimension was the strongest, (negative) predictor of relationship satisfaction ($r$ = - .49). This finding is consistent with previous work by Bartholomew and Horowitz (1991) and Li and Chan, (2012) who similarly found the anxious attachment dimension is associated with the most relationship dissatisfaction of all attachment dimensions. Alternatively, the avoidant attachment dimension had a smaller negative effect ($r$ = - .29) on relationship satisfaction. From the view of attachment theory, this latter finding may suggest that within the realms of a close relationship, individuals high in avoidant attachment often have a tendency to suppress or deny their own emotional distress and utilize autonomous coping methods (Gillath, Bunge, Shaver, Wendelken, & Mikulincer, 2005; Hazan & Shaver, 2004; Simpson, 1990; Simpson et al., 2007; Simpson & Rholes, 1998; Simpson et al., 1996). Potentially, when it comes to resolving relationship issues such as conflict, this sort of autonomous avoidant behaviour might be more problematic than for people with an anxious attachment.

To summarise, the current findings contribute to a deeper understanding of the interplay between Cyclothymic temperament and relationship satisfaction by shining light on the underlying mediating mechanisms of anxious and avoidant attachment. As expected, a mediating effect was found across three approaches to modelling Cyclothymic temperament. The current findings also illuminated differences with respect to hypomania and depression

proneness and the links to insecure attachment and relationship satisfaction. Specifically, hypomania and depression proneness demonstrated interpretable differences in their effects on insecure attachment and subsequent relationship satisfaction. A notable communality across all three models was that anxious attachment was the strongest negative predictor of relationship satisfaction.

### 9.6 Investigation of External Correlates of RAS

Prior to conducting the main modelling analyses of the study, a series of investigations sought to confirm the importance of the key dependent variable, relationship satisfaction measured on the RAS. Relationship status, CRS scores, the ability to maintain a relationship (rated on a 5-point scale), relationship duration and overall life satisfaction and well-being, are important features of a relationship that might be important to relationship satisfaction. As hypothesised, a one-way ANOVA found a significant association between relationship status and relationship satisfaction (H3). Post hoc analyses showed that individuals currently married or in a committed relationship scored higher on relationship satisfaction than those who were single (single individuals rated their level of relationship satisfaction based on how they generally feel in a relationship), separated or divorced. Results also indicated that the self-reported ability to maintain a relationship was positively correlated with relationship satisfaction (H3a).

Relationship duration (measured in months or years) was also positively correlated with relationship satisfaction (H3b). These findings must be treated with caution, as the current study was limited by the single item nature of the ability to maintain a relationship and relationship duration variables. Clearly, these complex and important constructs warrant further investigation with more specific and comprehensive measures. For example, in-depth interviews could offer a more detailed account of how an individual's ability to maintain a relationship and relationship duration impacts on their relationship satisfaction.

The current findings indicated, as expected, that greater relationship satisfaction was positively correlated with overall life satisfaction and general well-being (H3c). Thus, it seems the more satisfied one is with their close relationship, the happier and more satisfied they are with their life in general. This finding underlines the importance of previous research that suggests relationship satisfaction plays a key role in overall life satisfaction (Diener, Emmons, Larsen, & Griffin, 1985; Diener, Gohm, Suh, & Oishi, 2000; Gustavson, 2015; Mellor et al., 2008).

As noted above, the CRS was strongly and negatively correlated with relationship satisfaction (H3d). Although the CRS was not the main predictor variable, this key finding may have implications for understanding how cyclothymic moodiness may impact relationship satisfaction, and for developing hypotheses that may be tested in subsequent research. For instance, future research could investigate how people with increased cyclothymic moodiness communicate with their partner, experience commitment and resolve conflict. Previous studies have suggested that containment of relational conflict and effective intimate communication are vital to understanding, satisfaction, and well-being in lasting committed relationships (Eğeci & Gençöz, 2006; Guerrero, Farinelli, & McEwan, 2009; Mackey, Diemer, & O'Brien, 2004; Stanley, Markman, & Whitton, 2002). For instance, a study that collected data through in-depth interviews with 216 partners in 108 relationships that had lasted an average of 30 years, found that feeling connected in a close relationship and talking directly with each other about differences may have had the effect of defusing interpersonal differences before they began to erode the quality of relationships. Alternatively, withdrawals during conflict by either one or both partners were associated with less relationship satisfaction and often lead to estrangement (Mackey et al., 2004).

Taken together, the current project has highlighted that relationship status seems to play a valuable role in that married individuals or those in a committed relationship

experienced greater relationship satisfaction than single, separated or divorced individuals. Relationship longevity and the ability to maintain a relationship also appear to contribute to greater levels of relationship satisfaction. The potential positive connection between relationship satisfaction and general well-being and life satisfaction has also been clearly established. An important finding was that cyclothymic moodiness within the context of a relationship had a considerable negative effect on relationship satisfaction. However, more data and studies are required before any definitive conclusions can be drawn.

### 9.7 The Psychometric properties of the CRS

The CRS was purposely designed as an exploratory aspect of the present project, distinct from the overarching mediation prediction, to explore the process of Cyclothymic moodiness, insecure attachment and relationship satisfaction in more-depth. As predicted, support was found for the internal consistency of the CRS (H4a). An important step in evaluating the CRS is to demonstrate that the items adequately capture the underlying factors in the scale (H4). Results of the PAF did not support the theoretical three-factor structure (i.e., cognitive, emotional, behavioural domains) of the CRS. In fact inspection of the scree plot suggested a one-dimensional latent structure of the CRS. Thus, on the basis of items developed for the CRS, it appears that maladaptive cognitive, emotional and behavioural domains are so interwoven that they operate together and may not be measurable as three distinct factors. Alternatively, it is also possible that the theoretical three-factor structure of the CRS was not supported due to poor item design. For example, each of the items in the CRS was worded so similar that they probably did not adequately capture the underlying three-factor structure of the scale. One double-loading item was observed (item 13), and only one item (item 5) loaded weakly on all three CRS factors. Based on the findings suggesting the CRS is better conceptualized as a single-factor scale, item 5 was removed in order to improve reliability of the scale. However, removal of this item did not improve reliability of

the scale and was not deemed to be problematic. Therefore, when conducting analyses with the CRS, all of the 13-item items were included.

Empirical support for the CRS as a single-factor scale was provided by correlational analyses of the convergent and discriminant validity of the CRS (H4b – H4g). For example, as expected the CRS correlated strongly and positively with Cyclothymic temperament (H4b). The CRS was also strongly and positively correlated with the avoidant attachment dimension (H4d). Moderate positive correlations were found with hypomania (H4e) and depression (H4f) proneness and the anxious attachment dimension (H4c). A moderate negative correlation was found with relationship satisfaction (H3d). The CRS also demonstrated a negative correlation with satisfaction with life (H4g).

Taken together, these findings might indicate that highly emotionally unstable individuals have the tendency to react strongly and negatively in close relationship. Perhaps, people with increased cyclothymic moodiness may be less able to manage conflict and engage in mutual discussions and might express greater hostility (Ayduk et al., 2000; Downey, Feldman, & Ayduk, 2000). As discussed above, the CRS was also strongly and positively associated with the avoidant attachment dimension. Thus, it is possible that people exhibiting cyclothymic moodiness within the context of a relationship have an underlying avoidant attachment that impacts on their ability to function effectively in close relationships. For instance, the perceived rejection from a close partner during relationship conflicts might result in the individual expressing greater passive hostility by being cold and distant. These tendencies may influence not only the quality of their own relationship experiences (i.e., avoidance of problems and reduced satisfaction) but also their partners' experiences too (Taycan & Kuruoğlu, 2014).

A key strength of the CRS is its ability to assess cyclothymic moodiness within the context of a close relationship in a brief and psychometrically sound manner. Many potential

avenues remain for the future use of the CRS, including its replication and extension in a clinical sample. Future studies could also investigate further the conflict-resolving and communication patterns in people experiencing severe affective instability. Longitudinal studies investigating the predictive validity and test-retest reliability of the CRS could also increase understanding of how cyclothymic moodiness within the context of a close relationship relates to trait vulnerability to BD, insecure attachment and relationship satisfaction over time. Combined with other psychosocial information such as family and relationship history, the use of the CRS could provide clinicians with unique information in the context of assessment. That is, as the primary mediation hypothesis was supported, the CRS might be an important tool in *future research* for identifying and 'connecting' with people with BD who would benefit from an attachment bond orientated version of FFT for BD. This might work through the direct manipulation of insecure attachment schema as a mediation of change (see also sections 3.9 and 9.9), which in the process changes relationship outcomes.

### 9.8 Limitations of the Current Project and Future Considerations

The following section discusses the limitations of the present study. First, four major limitations will be discussed, and then six minor limitations are described.

The first major limitation is that the present study employed cross-sectional self-report data. Due to the cross-sectional nature of the study, directional and causal inferences cannot be drawn. While it was proposed that anxious and avoidant attachment mediates the relationship between Cyclothymic temperament and levels of relationship satisfaction, it is equally plausible that the presence of relationship problems and reduced relationship satisfaction may lead an individual to employ particular emotional regulation strategies consistent with these temperament and attachment dimensions.

The limitations of single, cross-sectional designs highlight the need for repeated assessments of the same individuals across time. Longitudinal trajectories of Cyclothymic temperament and insecure attachment dimensions in the specific context of close relationships would provide the optimal data for exploring the present projects core questions. For instance, longitudinal studies are ideally suited to capture the time-dependent nature of close relationships and are consistent with the idea that trait vulnerability to BD and insecure attachment dimensions remain stable across the lifespan. Such designs are crucial for illuminating the direction of casual inferences, for modelling reciprocal influences over time, for examining change and stability in temperament and relationships, and for placing temperament and relationship phenomena within a lifespan developmental perspective (Cooper, 2002).

Future research could usefully measure Cyclothymic temperament and insecure attachment dimensions at various stages in longitudinal cohort studies with children identified at risk of BD. Children at risk may include the offspring of a parent with BD. A possible baseline study might include observations of potential affective functioning in a sample of children high versus low on Cyclothymic temperament, as well as encompassing observational data using Ainsworth et al's. (1978) Strange Situation. Interactional data between offspring and the parent could be used to ascertain the child's attachment dimension. Rapid mood change, depressive, manic or hypomanic features might be suggestive of Cyclothymic temperament. A second wave follow-up study could be conducted in adolescence or early adulthood where the current study measures could be administered to determine dimensions of affective functioning, attachment dimensions and relationship satisfaction. A Structured Clinical Interview that assesses DSM-5 mood episodes and disorders might also be conducted (SCID-5 CV; First, Williams, Karg, & Spitzer, 2015). Information obtained from the SCID-5 could identify those individuals who have progressed

to clinical BD. A third wave follow-up study at age 30 could again administer dimensional measures relating to trait vulnerability to BD (Cyclothymic temperament, hypomania and depression proneness), insecure attachment, cyclothymic moodiness within the context of a relationship, relationship satisfaction and satisfaction with life. By assessing these constructs at different time points, the results could offer valuable evidence for the developmental aspect of BD and insecure attachment across the lifespan. Furthermore, a study such as this might help to understand how these two constructs impact on relationship satisfaction. Such findings may offer a more in-depth understanding of the links between vulnerability to BD, insecure attachment and relationship satisfaction, and as such, may have significant implications for clinical theories and interventions in people with BD.

A further longitudinal study might consist of adolescent or adult participants diagnosed with BD. For instance, the ECR-R could be administered to ascertain those with an insecure attachment. Participants could then be assigned to one of two conditions. This could include *no therapeutic intervention* versus a *therapeutic intervention* group that looks at changes in attachment. The no therapeutic intervention condition might include the sole use of pharmacological treatment such as Lithium. The therapeutic intervention group might include the use of Lithium that is administered in conjunction with 20-30 individual therapy sessions. Perhaps, CBT (and/or FFT) could be administered over the span of one year where sessions would aim to create positive changes in attachment and close relationships. A follow-up assessment could be conducted several years later to investigate whether positive changes in attachment and relationship outcomes have ensued in the therapeutic intervention group versus no therapeutic intervention groups.

The second major limitation relates to the assessment method which involved only the use of self-report measures. A particular limitation of self-report measures is the risk of confounding with current mental state (van de Mortel, 2008). The current study failed to

control for current mood state. However, self-report measures remain the most cost-effective and easily implemented method for conducting a research project such as this, future research could utilise other forms of data collection such as interviews. For instance, future qualitative studies might design a series of interview questions that aim to comprehensively assess cyclothymic mood instability across time, past relationship experiences with caregivers, and various features of relationship history and relationship satisfaction. A qualitative interview would target the micro-level of experiences around Cyclothymic temperament, insecure attachment and relationship satisfaction.

A third major methodological limitation is the extension of the use of the RAS to not only include participants in a relationship (at the time of the current study) but as previously mentioned in section 7.6, the RAS (originally designed for couples) was extended to also investigate relationship satisfaction amongst participants, some of whom were (at the time of study participation) single, separated, divorced or widowed. It was assumed here that participants who identified as not currently in a relationship based their RAS responses on a previous relationship experience. Thus, the current results may not paint a clear picture about relationship satisfaction, as the validity and reliability of the RAS might be less than optimal for use in people not currently in a relationship. It is conceivable that the level of relationship satisfaction reported by those not involved in a relationship created an element of bias. This might include the now romanticized relationship with a deceased spouse, or the negative rating of a past relationship that did not work out. As such, this may have inflated or deflated estimates of relationship satisfaction in these particiants. Indeed, there is some evidence that the RAS produces more reliable scores when administered to older individuals, older relationships, and married couples (Graham, Diebels, & Barnow, 2011). Concerns about the impact of this limitation on the present findings are mitigated by the fact that (a) most participants $n$ = 283 (78%) were in a current relationship (married, in a committed or casual

relationship), and (b) secondary analyses limited to those $n = 283$ in a current relationship generated identical findings to those conducted on the full sample (see Appendix L). Furthermore, the inclusion of participants who were not in a relationship enhanced the generalizability of the findings and this was important considering much research on relationship satisfaction has focused solely on those in a relationship.

A fourth major methodological limitation is that the current project focused entirely on insecure attachment as a mechanism or process by which Cyclothymic temperament effected relationship satisfaction. There is likely to be a multitude of reasons why people vulnerable to BD experience relationship (dis)satisfaction. Perhaps, there are a number of psychological mechanisms (including many unrelated to attachment) that could impact levels of relationship satisfaction. These might include the waxing and waning of self-esteem, work and family commitments (Neff, Sonnentag, Niessen, & Unger, 2015) and sexual desire in long-term relationships (Birnbaum et al., 2016). However, as previously mentioned, there exists a significant body of research linking anxious and avoidant attachment to relationship difficulties and dissatisfaction (for a review, see Li & Chan, 2012).

Nevertheless, it is possible that alternative models could have been tested with Cyclothymic temperament or relationship satisfaction as mediators. However, alternative models were not tested for several reasons: 1) the framework would need to have been rewritten to support this rationale. Previous studies have demonstrated the importance of relationship quality as a mediating variable in the association between psychopathy and subjective well-being (Love & Holder, 2016), romantic attachment and family functioning (Pedro, Ribeiro, & Shelton, 2015) and between neuroticism and satisfaction in couples (Finn, Mitte, & Neyer, 2013). One study has also investigated the mediating role of Cyclothymic temperament in the association between bulimia nervosa and atypical depression (Perugi et al., 2006). Thus, Cyclothymic temperament or relationship satisfaction could have been

tested as mediators, but this strategy was not consistent with the overarching rationale of the study. Affective temperaments are considered to be biologically based, driven by genetic influences and acting as more distal causes (Akiskal, 2007; Evans et al., 2005; Kelsoe, 2003), whereas insecure attachment has its origins in the parent-child relationships (more proximal causes) and evolving through life (Gleeson & Fitzgerald, 2014; Pascuzzo et al., 2013). On these grounds, all models located Cyclothymic temperament (however measured) as an antecedent of insecure attachment.

Thus, for the purpose of the current project, insecure attachment is a plausible, defensible mediating construct that could be modelled as explaining why people with vulnerability to BD experience relationship dissatisfaction. The current findings have provided some important groundwork on which future studies could build. Understanding insecure attachment as potential mechanism of change is the path toward improved treatment in people with BD who experience relationship difficulties. Needless to say, further work and the exploration of alternative mechanisms are critical.

Further studies might include the exploration of unexplained promiscuous behaviour and extra marital affairs. This is both interesting and could certainly tell us something very important about what people with Cyclothymic temperament do behaviourally. These sorts of behaviours might be viable if the researcher were interested in short-term mediation (minutes, days, and weeks). However, as discussed in Chapter 3, for the purpose of the current project, here the focus is a more developmental time-frame. Measuring these additional variables was beyond the scope of the current study. Future research could usefully investigate these momentary and immediate causes. A more in-depth look at say the sexual health of people with BD (or vulnerable to BD) and how this subsequently impacts on their relationships is warranted. A review into hyper-sexuality and couples relationships in BD has recently

highlighted the need for more research in this area (Kopeykina et al., 2016). This would greatly help to inform treatment and improve relationship outcomes in people with BD.

Aggressive, hostile and anger related behaviours might also warrant further investigation as potential mediators in the association between vulnerability to BD and relationship satisfaction. Indeed, increased hostility and aggression is specifically associated with BD, especially during acute and psychotic episodes (Ballester et al., 2014; Ballester et al., 2012). While there is a scarcity of studies dealing with the relationship between Cyclothymic temperament and aggression, recent results suggest that people with Cyclothymic temperament similarly display increased anger and hostility (Dolenc et al., 2015). Additional psychometric tests such as the State-Trait Anger Expression Inventory (STAXI-2) could assess levels of anger and hostility in close relationships and investigate whether these sorts of behaviours act as mediators in the association between Cyclothymic temperament and relationship satisfaction. Although the concept of anger and irritability was of interest in the current study, in order to narrow focus and minimize participant burden, the STAXI-2 was not included. This is certainly an area of future interest in terms of considering anger related behaviours as a mechanism of change in people with BD.

To fully understand the role of Cyclothymic temperament and insecure attachment in the context of close relationships, future research could also focus on the couple dyad. Measuring the dyad could provide vital information on the similarities or differences in cognitive and emotion regulation strategies between couples and how these similarities or differences impact on their relationship outcomes (Ben-Ari & Lavee, 2005; Domingue & Mollen, 2009; Taycan & Kuruoğlu, 2014). A future study might investigate differences in temperament, adult attachment of married and cohabiting couples using dyadic logistic multilevel models, and relationship satisfaction. For example, an investigation might focus on whether partners with similar temperaments and attachment dimensions are happier in their

relationship (Taycan & Kuruoğlu, 2014). Perhaps, the inclusion of other variables such as conflict resolution, and Expressed Emotion (EE) could also provide a more in-depth analysis of levels of relationship satisfaction and compatibility.

Some more minor limitations should be acknowledged. First, in terms of measurement, attachment in this study was assessed as adult romantic attachment by self-report (ECR-R), and alternative measures have been developed (Brennan et al., 1998; Crowell & Treboux, 1995; Roisman et al., 2007; Stein, Jacobs, Ferguson, Allen, & Fonagy, 1998). These include the Adult Attachment Scales (AAS: Collins & Read, 1990), the Relationship Questionnaire (RQ: Bartholomew & Horowitz, 1991), and the Relationships Scales Questionnaire (RSQ: Griffin & Bartholomew, 1994). Furthermore, research has forwarded alternative methods of assessing insecure attachment dimensions based on common interview methods. The Adult Attachment Interview (AAI) has been found to be a reliable indicator of attachment dimensions. A defining feature of the AAI is its ability to measure an adult individual's current state of mind with respect to earlier life experience (Neborsky & Bundy, 2013). Whilst alternative semi-structured interview measures might offer a more in-depth account of attachment dimensions, their use in the current project was not feasible. For the purpose of the current study, the ECR-R is entirely plausible, and was the best of all feasible measures. Not only is it commonly used cross-culturally in nonclinical populations, but it is relatively quick, simple and easy to complete. Furthermore, it was important to capture attachment more proximal to the problems, which may be a combination of early and later attachment history. Future research might also benefit from other methods of obtaining information about insecure attachment. This may encompass the use of the AAI (Neborsky & Bundy, 2013). Alternate studies may also choose to focus on a broader range of relationship variables, such as inter-partner violence, abuse, neglect and psychopathology.

Second, as previously discussed, extensive research on affective temperaments has been performed using the TEMPS-A (Vazquez & Gonda, 2013). In retrospect, together with Cyclothymic temperament, this method may have also been used to measure hypomania proneness (TEMPS-hyperthymic) and depression proneness (TEMPS-depression). Nonetheless, hypomania and depression proneness using the sGBI were found to shed some valuable light on a two-dimensional and aggregate view of Cyclothymic temperament. As a result, the current study advances understanding of the associations between hypomania and depression proneness, insecure attachment and relationship satisfaction.

Third, a number of constructs were measured with variables of unknown psychometric quality. Single item measures, e.g., the ability to maintain a relationship and relationship duration, are measures with unknown test-retest reliability. Although beyond the focus of the current study, there is certainly some scope for deeper work and the vital need to develop a better more detailed relationship scale. Nonetheless, the results did encourage the development of hypotheses for future investigations.

Fourth, generalisability is likely limited in a number of ways. For instance, there was a predominance of females in the sample. This is likely to have been influenced by the recruitment method, which involved placing posts on psychology and mood disordered web-sites, as the vast majority of persons accessing these sites are likely to be females (Hendrick, Altshuler, Gitlin, Delrahim, & Hammen, 2000). Future studies should seek to increase the proportion of males so proper attention can be paid to possible gender differences. Further, the sample was weighted toward highly educated people in that 43.1% of the sample had postgraduate education. This may not be representative of the general population (see e.g. Alloy, 2012).

Fifth, the sample may have been biased towards individuals with trait vulnerability to BD as some participants were recruited from mood disorder web-sites. Nevertheless, mean

distributions in the current sample were comparable to distributions in previous published research (Akiskal, Akiskal, Haykal, et al., 2005; Depue et al., 1989; Diener et al., 1985; Eckblad & Chapman, 1986; Fairchild & Finney, 2006; Harnic et al., 2014; Hendrick, 1988; Henry & Crawford, 2005; Hirschfeld et al., 2000; Pavot & Diener, 1993; Poulios, Murray & Bullock, 2010).

Sixth, some limitations to using SEM should be noted. Although all structural models (see Figures 4, 6 & 8) were a good fit to the data based on most general fit indices, these well-fitting models do not necessarily imply that they are the only models that fit the data. Future researchers may want to test an alternative direction of the arrows and even the content of the model. Perhaps, relationship satisfaction or insecure attachment predicts temperament or character, much like the works of Taycan and Kuruoğlu, (2014).

In the context of the study's limitations, it is hoped that the current work will help inspire future research into the effects of temperament and attachment on relationship outcomes in a more nuanced and comprehensive way. Perhaps, a future study may encompass both attachment theory (Bowlby, 2005) and the application of the Behavioural Activation System or BAS (Gray, 1982) to investigate approach-avoidance type behaviours in people with clinical BD and in those with vulnerability to BD. One might predict an association between approach type behaviours and the anxious attachment dimension, and between avoidant type behaviours and the avoidant attachment dimension.

Developmentally, it would also be valuable to explore these kinds of issues in future longitudinal designs. For example, at the level of neurotransmitters, adult attachment has been correlated with many of the same neurobiological systems implicated in affect, mood and temperament including the HPA axis (Laurent & Powers, 2007) and serotonin and oxytocin systems (Buchheim et al., 2009; Gonda et al., 2006; Kawamura et al., 2010). Looking more carefully at the similarities and differences between these two constructs

across time could provide a better understanding of the links between temperament, attachment and psychosocial functioning.

## 9.9 Clinical Implications

As discussed above, Cyclothymic temperament and clinical BD are assumed to exist along a bipolar spectrum on which people vary in their degrees of affective functioning (Akiskal & Mallya, 1987; Depue et al., 1981). Therefore, the results of the current study may hold clinical implications for diagnosable BD. First of all, they suggest that anxious and avoidant attachment as mediators may be important in the relationship between Cyclothymic temperament and lower relationship satisfaction. Although the present study focused on Cyclothymic temperament in a non-clinical sample, the findings may inform clinical practice and interventions as the results suggest support for targeting insecure attachment as a way to improve relationship satisfaction in people diagnosed with BD. The following subsections elaborate on this potentially important implication.

### 9.9.1 Working with clients with BD.

#### *9.9.1.1 Insecure attachment.*

From a theoretical perspective, the present study has illuminated the mediation effect of insecure attachment dimensions in the association between bipolarity and relationship satisfaction. Particularly, the use of the ECR-R may give clinicians considerable insight into how people with BD experience close relationships. Furthermore, as discussed above (see section 9.7), the administration of the CRS in clinical practice could in the future be an important tool for detecting and relating to people with BD.

As discussed in section 3.9 ABFT & EFT are two empirically validated treatment that's basis is in attachment theory. Illuminating individual differences in attachment could change how treatment providers engage with someone who has BD. For instance, when

patients come for treatment, it is likely that attitudes they hold towards the treatment and their providers are shaped by previous relationship experiences, more specifically, their attachment dimension. There may be implications to consider for psychotherapy in people with BD. For instance, childhood maltreatment, which disrupts the formation of positive mental models of oneself and others, impairs patient's abilities to form supportive clinical relationships during treatment for depression (Hocking, Simons, & Surette, 2016; Reiner, Bakermans-Kranenburg, Van Ijzendoorn, Fremmer-Bombik, & Beutel, 2016). Previous relationship experiences may also influence how trusting patients are (Gleeson & Fitzgerald, 2014). This could have implications for quality of the working alliance patients establish with a treatment provider (Greenberg et al., 2014; Smith, Msetfi, & Golding, 2010). Shorey & Snyder (2006, p.16) recommend that attachment dimensions should be assessed as a standard part of treatment planning. This was suggested as a way to allow therapists to be attentive to potential problems that may occur in the development of the alliance as a result of insecure attachment dimensions. For instance, learning more about clients who leave therapy prematurely or who stay in therapy may offer a distinctive view of differences within secure and insecure attachment dimensions (Shorey & Snyder, 2006).

Using attachment theory as a guide, therapeutic change occurs as insecure clients (contrary to their previous experience) experience a containing and responsive relationship with their therapist (Bernecker, Levy, & Ellison, 2014; Mallinckrodt & Jeong, 2015). That is, the therapist as an attachment figure assists the patient with their emotional regulation and reflection on past and current attachment relationships, including the one with the therapist – provided that the patient can use the therapist as a "secure base" and form a working alliance with the therapist (Mikulincer, Shaver, & Berant, 2013; Reiner et al., 2016; Shorey & Snyder, 2006; Smith et al., 2010). While psychotherapy cannot alter adverse or traumatic experiences with early attachment figures, studies have shown that psychotherapy helps process and

integrate emotionally difficult experiences, which are reflected in more coherent attachment representations (Reiner et al., 2016). By working through difficulties in present relationships, individuals with BD may build an understanding that at least some of these difficulties may be rooted in early attachment experiences.

Psycho-educational material could also focus on the importance of effective emotion regulation strategies that aim to reduce negative emotion-related behaviours (e.g., hostility, irritability and anger). Anger management skills may also prove beneficial in those with intermittent explosive, aggressive behaviour (Deffenbacher, Oetting, & DiGiuseppe, 2002). Consistent with the development discussions above (see Chapter 3), the treating clinician might also find it beneficial to elicit a detailed family history of the early caregiving environment, searching for evidence of exposure to bipolar illness, unpredictable caregiving patterns, sexual, emotional or physical abuse, increased expressed emotion, low parental warmth, and inter-parental conflict that might include early environmental stressors such as parental loss, divorce or separation (Alloy et al., 2006; Alloy et al., 2005; Etain et al., 2013; Etain et al., 2010). These sorts of negative early childhood experiences might shape a persons' attachment pattern, especially in people with trait vulnerability to BD (Kokcu & Kesebir, 2010).

Importantly, the present study suggests that people with depression proneness may find it particularly difficult to get close to others and are likely to steer clear of emotional closeness and intimacy in close relationships, which in turn has a negative direct effect on their level of relationship satisfaction. The typical response to an argument, conflict or other stressful situations in people with avoidant attachment is to become distant and aloof (Simpson et al., 2015; Simpson et al., 1996). Consequently, people with depression proneness may avoid committed or long-term relationships and endure persistent loneliness and social isolation (Bhat et al., 2014). These individuals should be encouraged to develop behaviours

that decrease anxiety and psychological distress and promote social and emotional competence without resorting to avoidant techniques. Fostering corrective experiences could help people with depression proneness and an avoidant attachment move toward increased interaction with other people, seek out social support, or appropriately ask for help instead of attempting to cope with emotional problems on their own.

One point to consider is the extension of FFT for BD to include an additional schema and attachment focus (Miklowitz & Chung, 2016; Miklowitz & Gitlin, 2015; Miklowitz et al., 2013). Potentially, additional strategies might focus respectively on improving maladaptive beliefs about rejection and abandonment and perceptions that one is unloveable (anxious attachment dimension), and of avoidance of intimacy, based on expectations that attachment needs will not be met (avoidance attachment). Ameliorated schemas might result from new experiences in interaction with an accepting therapist, new experiences evolving from increased mentalization abilities, and new experiences due to a better and more compassionate understanding of previous negative interactions with attachment figures (Ak, Lapsekili, Haciomeroglu, Sutcigil, & Turkcapar, 2012; Bosmans, Braet, & Van Vlierberghe, 2010; Halvorsen et al., 2009; Hawke & Provencher, 2012; Hawke, Provencher, & Parikh, 2013).

Within this revised FFT, caregivers or partners may also benefit from psycho-education oriented towards understanding their own attachment thoughts, feelings and behaviours, as well as that of their partners. In this context, illuminating the attachment dimensions of both the carer and their partner could shed some light on the quality of relationship and how insecure attachment may be contributing to relationship dissatisfaction when BD is present in the couple.

#### *9.9.1.2 Relationship satisfaction.*

While the reasons for unsatisfying and satisfying relationships are likely diverse and numerous, the current study has illuminated the importance of drawing on attachment theory to help understand why people with Cyclothymic temperament experience low relationship satisfaction. The ability to maintain a relationship and cyclothymic moodiness within the context of a close relationship may also give a deeper insight into aspects of relationship functioning that generates a positive or negative effect on relationship satisfaction. The current study shows that levels of relationship satisfaction can have a significant effect on overall life satisfaction and psychological well-being (Mellor et al., 2008; Lucas, Clark, Georgellis & Diener, 2003). Accordingly, general well-being and overall life satisfaction might also be assessed using the SWLS.

Thus, as well as emphasizing the importance of changing maladaptive schemas to facilitate change in attachment, encouraging a relationship focus in clinical work might also be beneficial. People with BD are prone to perceiving (often inaccurately) that their partner's behaviours are indications of possible rejection, which leads them to behave in ways that elicit rejection from their partners (Harnic et al., 2014; Kokcu & Kesebir, 2010; Marazziti et al., 2007; Morriss, van der Gucht, Lancaster, & Bentall, 2009). For example, as discussed in Chapter Five, frequent conflict, and aggressive, irritable and violent behaviours are often considered to be a problem in people with BD. These sorts of behaviours are likely to create a chaotic family atmosphere and have a negative impact on the subjective well-being of all family members (Beentjes, Goossens, & Poslawsky, 2012; Coryell et al., 1993; Dore & Romans, 2001; Judd et al., 2005; Lam et al., 2005; Michalak et al., 2006; Miklowitz et al.,1988; Sheets & Miller, 2010; Whisman, 2007).

Evidence based therapeutic treatments such as couples counselling and/or family-based psycho-educational interventions may prove beneficial in that they aim to improve

relationship satisfaction and family functioning using a combination of communication, problem-solving, coping strategies, psycho-education and relapse rehearsal training (Elgie & Morselli, 2007; Goldstein & Miklowitz, 1997; Hooley, 2007; Luciano et al., 2012; Miklowitz, 2007; Miklowitz, Biuckians, & Richards, 2006; Miklowitz & Gitlin, 2015; Miklowitz et al., 2013; Scott & Colom, 2005). There is also evidence to suggest they can improve life satisfaction and general well-being (Castle, Berk, Lauder, Berk, & Murray, 2009; Murray & Michalak, 2012).

Family-based treatments (FFT for BD) could also be advantageous in that they provide a useful context for the client's partner or family to understand their loved one and view their negative behaviours as part of either a long-standing temperamental (or severe psychiatric illness) and attachment insecurity instead of maybe viewing them as a bad or mean (Fast & Preston, 2004). This could to some degree placate any risk of symptom escalation and relationship conflict, and jointly examine ways in which the current relationship may be radically improved. It could also help increase the families' awareness about the "red flag" warning signs that signify potential periods of clinical depression or hypomania (Akiskal, 2005), as well as increase their self-awareness of how their own expressed emotion can influence that of others (Hooley, 2007; Johnson et al., 1999; Proudfoot et al., 2011).

The treating therapist could also observe patterns of behaviour exchange between couples and ascertain whether partners are temperamentally a 'good-fit' (Thomas & Chess, 1984). For example, compassionate, supportive, warm partners with effective intimate communication and a secure attachment could placate any potential emotional escalation by responding with positive reinforcement and positive social support (Wingo et al., 2010). Alternatively, relationships in which partners fail to provide emotional support, are critical or overprotective are likely to become comparatively dysfunctional or disturbed. Treating

therapists might encourage clients and their partners to see how negative social-emotional interactions and ineffective communication patterns procure negative relationship outcomes (Domingue & Mollen, 2009; Eğeci, & Gençöz, 2006; Guerrero, Farinelli, & McEwan, 2009; Miklowitz, 2007; Simoneau et al., 1998).

People with BD who want to start a family, might also benefit from psychological support before, during and after the birth of their child. Perhaps, tailored parenting programs could be established that focus on the importance of a secure attachment, emotional availability, consistency, and providing a supportive, warm and nurturing environment (Kokcu & Kesebir, 2010). Matters such as these might play a significant role in preventing some of the adverse effects of BD on children, and could also reduce the risk of intergenerational transmission of insecure attachment and relationship difficulties by helping people with BD develop a positive self-image (Jones, Cassidy, & Shaver, 2015). Material should be administered with caution as it is likely that many people with BD and an insecure attachment lack confidence in their ability to care for children. It is also possible they express guilt about the possibility that their children may inherit a clinical disorder and view being a good parent as important in the maintenance of their self-esteem (Jones et al., 2005; Scott, 1996a, 1996b). Nevertheless, it is essential to delicately approach the topic of effective parenting in people with BD.

## 9.10 Conclusion

The present project was unique in that it was, to the author's knowledge, the first to investigate the complex interplay between traits related to BD, insecure attachment dimensions and adult relationship satisfaction. Specifically, the testing of three structural models has revealed the mediating effect of anxious and avoidant attachment dimensions between Cyclothymic temperament and relationship satisfaction. Whichever way Cyclothymic temperament was conceptualised, a mediation effect was found.

A one-dimensional view of Cyclothymic temperament indicated both anxious and avoidant attachment fully mediated the relationship between Cyclothymic temperament and relationship satisfaction. A slightly stronger mediation effect was found for the avoidant attachment dimension in this model. A two-dimensional view of Cyclothymic temperament established a strong and direct effect between depression proneness and the avoidant attachment dimension, which in turn had a lesser negative effect on relationship satisfaction than the anxious attachment dimension. Hypomania proneness was weakly associated with both anxious and avoidant attachment dimensions in this model. A nested model of Cyclothymic temperament suggests that hypomania proneness may be indirectly related to insecure attachment dimensions through links with Cyclothymic temperament and depression proneness, which more directly relate to insecure attachment dimensions. In this model, both anxious and avoidant attachment each equally mediated the relationship between Cyclothymic temperament and relationship satisfaction. Depression proneness was strongly and directly linked to the avoidant attachment dimension. All three models demonstrated that the anxious attachment dimension was the most robust predictor of reduced relationship satisfaction.

Being married or in a committed relationship, the ability to maintain a relationship and relationship longevity had a significant positive effect on relationship satisfaction. Relationship satisfaction was found to have considerable implications for overall general and psychological well-being, with significant links found between relationship satisfaction and satisfaction with life. Cyclothymic moodiness within the context of a close relationship was also found to have a significant negative effect on levels of relationship satisfaction. Preliminary exploratory evidence has also been presented to suggest that the CRS is a reliable, valid and efficient means for measuring cyclothymic moodiness within the context of a close relationship.

The present project has filled an important gap in the literature regarding the role that Cyclothymic temperament and insecure attachment dimensions play in predicting lower relationship satisfaction. Potentially, the current findings could make an incremental theoretical and practical contribution to the bipolar spectrum literature. As previously discussed in section 4.1, some clinical research has also found insecure attachment in people with BD and BPD. By illuminating these resemblances it is possible the current study has discovered a previously unseen link suggesting that insecure attachment is important throughout the bipolar spectrum.

Thus, to help understand the pathways by which Cyclothymic temperament contributes to relationship (dis)satisfaction, the theoretically rich, well-researched construct of insecure attachment seemed to warrant consideration as a hypothetical mediator. It's not argued here that attachment is the most important of all possible mechanisms (more proximal behaviours might be as important) but existing evidence for psychological therapies for BD suggests that a great focus on such psychological constructs may be fruitful. Data here suggesting the proximal importance of a developmental schema-related process can only be suggestive. Thus, the interplay between trait vulnerability to BD, insecure attachment and relationship outcomes can no longer be ignored and may have implications for understanding and even reducing the consequences of the mood dysregulation at the heart of BD.

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# APPENDIX A – Diagnostic Criteria for BD-I and BD-II

Outlined in the DSM-5 (APA, 2013) it is necessary to meet the following criteria (A – D) for a manic episode. [4]

**Bipolar I Disorder**

**Manic Episode**

**A.** A distinct period of abnormally and persistently elevated, expansive, or irritable mood and abnormally and persistently increased goal directed activity or energy, ***lasting at least 1 week*** and present most of the day, nearly every day (or any duration if hospitalization is necessary).

**B.** During the period of mood disturbance and increased energy or activity, three (or more) of the following symptoms (four if the mood is only irritable) are presented to a significant degree and represent a noticeable change from usual behaviour:

1. Inflated self-esteem or grandiosity.
2. Decreased need for sleep (e.g., feels rested after only 3 hours of sleep).
3. More talkative than usual or pressure to keep talking.
4. Flight of ideas or subjective experience that thoughts are racing.
5. Distractibility (i.e., attention too easily drawn to unimportant or irrelevant external stimuli), as reported or observed.
6. Increase in goal-directed activity (either socially, at work or school, or sexually) or psychomotor agitation (i.e., purposeless non-goal directed activity).

[4] At least one lifetime manic episode is required for a diagnosis of BD-I in DSM-5. The manic episode may have been preceded by and may be followed by hypomanic or major depressive episodes. The occurrence of the manic episode(s) is not better explained by schizoaffective disorder, schizophrenia, schizophreniform disorder, delusional disorder, or other specified or unspecified schizophrenia spectrum and other psychotic disorder.

7. Excessive involvement in activities that have a high potential for painful consequences (e.g., engaging in unrestrained buying sprees, sexual indiscretions, or foolish business investments).

**C.** The mood disturbance is sufficiently severe to cause marked impairment in social or occupational functioning or to necessitate hospitalization to prevent harm to self or others, or there are psychotic features.

***D.*** The episode is not attributable to the physiological effects of a substance (e.g., a drug of abuse, a medication, other treatment) or to another medical condition.

Outlined in the DSM-5 (APA, 2013) it is necessary to meet the following criteria for hypomanic episode:

**Bipolar II Disorder**

**Hypomanic Episode**

**A.** A distinct period of abnormally and persistently elevated, expansive, or irritable mood and abnormally and persistently increased activity or energy, ***lasting at least 4 consecutive days*** and present most of the day, nearly every day.

**B.** Criterion B for a hypomanic episode is identical to that of a manic episode described above.

**C.** The episode is associated with an unequivocal change in functioning that is uncharacteristic of the individual when not symptomatic.

**D.** The disturbance in mood and the change in functioning are observable by others.

**E.** The episode is not severe enough to cause marked impairment in social or occupational functioning or to necessitate hospitalization. If there are psychotic features, the episode is, by definition, manic.

**F.** The episode is not attributable to the physiological effects of a substance (e.g., a drug of abuse, a medication, other treatment).

**Major Depressive Episode** [5]

**A.** Five (or more) of the following symptoms have been present during the same 2-week period and represent a change from previous functioning; at least one of the symptoms is either (1) depressed mood or (2) loss of interest or pleasure. Note: does not include symptoms that are clearly attributable to another medical condition.

1. Depressed mood most of the day, nearly every day, as indicated by either subjective report (e.g., feels sad, empty, or hopeless) or observation made by others (e.g., appears tearful). (Note: In children and adolescents, can be irritable mood).
2. Markedly diminished interest or pleasure in all, or almost all, activities most of the day, nearly every day (as indicated by either subjective account or observation).
3. Significant weight loss when not dieting or weight gain (e.g., a change of more than 5% of body weight in a month), or decrease or increase in

[5] Even though major depressive episodes are common in BD-I they are not required for the diagnosis of BD-I.

appetite nearly every day. (Note: In children, consider failure to make expected weight gain).

4. Insomnia or hypersomnia nearly every day.
5. Psychomotor agitation or retardation nearly every day (observable by others; not merely subjective feelings of restlessness or being slowed down).
6. Fatigue or loss of energy nearly every day.
7. Feelings of worthlessness or excessive or inappropriate guilt (which may be delusional) nearly every day (nor merely self-reproach or guilt about being sick).
8. Diminished ability to think or concentrate, or indecisiveness, nearly every day (either by subjective account or observed by others).
9. Recurrent thoughts of death (not just fear of dying), recurrent suicidal ideation with-out a specific plan, or a suicide attempt or a specific plan for committing suicide.

**B.** The symptoms cause clinically significant distress or impairment in social, occupational, or other important areas of functioning.

**C.** The episode is not attributable to the physiological effects of a substance or another medical condition.

# APPENDIX B - Participant Information Statement

SWINBURNE UNIVERSITY OF TECHNOLOGY

**Swinburne University of Technology**

Faculty of Life and Social Sciences

**PARTICIPANT INFORMATION STATEMENT**

Dear Prospective Participant,

You are invited to participate in an online research project being conducted by Swinburne University of Technology. The aim of the present study is to investigate factors that may contribute to levels of relationship satisfaction. The present study is interested in temperament, features of close relationships, vulnerability to moodiness, relationship satisfaction and general satisfaction with life. Please ensure you read this information statement carefully before deciding whether you would like to complete the survey.

**Title of the project:** Temperament and Close Relationships.

**Who is involved in this research?** This project is being conducted by Mrs Sarah Fraser as part of the research component of the Doctorate in Clinical Psychology at Swinburne University of Technology. The project is supervised by Associate Professor Greg Murray who is the Director of Clinical Psychology Programs based at Swinburne University of Technology.

**If I agree to participate, what will I be required to do?** As we are interested in factors that may contribute to relationship dissatisfaction it is a study requirement that you have experienced at least one committed close relationship. We also ask that you only complete the questions if you are aged between 18 and 65 years of age. The questions are written in English so you must have an understanding of the English language. If you decide to proceed you will be firstly asked a small number of demographics questions, followed by a series of questions relating to your temperament, experiences in close relationships, mood, relationship satisfaction and general well-being. Participation should take about thirty minutes of your time. There are no right or wrong answers and we only ask you to answer each question honestly. You are under no obligation to complete the questions and may change your mind if you do so wish at any time. All responses will remain completely anonymous and confidential as no identifying information is required. The completion of the online questionnaire will indicate your consent to participate.

**Are there any risks associated with participation?** It is not anticipated that your involvement in this study will pose a risk. However, answering questions regarding sensitive issues such as temperament, mood, features of close relationships, levels of relationship satisfaction and overall life satisfaction

may cause discomfort in some individuals. If you are concerned about your responses to any of the questionnaire items and you find participation in this project distressing you are entitled to withdraw at any time. If this research raises issues which you would like to discuss with a professional, Australian participants can contact the Swinburne Psychology Clinic on (03) 9214 8653 (a low-cost service), Swinburne Counselling Services on (03) 9214 8025 (Hawthorn) or (03) 9215 7101 (Lilydale), Lifeline on 13 11 14 or the Australian Psychological Society on (03) 8662 3300. International participants can contact the Lifeline International; this service provides free, 24-hour telephone counselling and support to countries around the globe. Details of how to contact this service in your home country can be found on their website: http://www.lifeline-international.org/looking_for_help. If you reside in a country other than Australia and would like to take part in the research, please be aware of any local or government restrictions that may prevent you from participating in foreign research.

**What are the benefits associated with participation?** Whilst there are no immediate direct benefits to you, your participation will assist in our understanding of factors that may contribute to relationship satisfaction in the general population.

**What will happen to the information you provide?** The information you provide will be kept secure and confidential at all times. The anonymous web-based responses are protected by a multiple layer of security. This includes private passwords and the latest in firewall and intrusion prevention technology. Please note you are not required to give any identifying information ensuring your complete anonymity. The findings from this study may be presented at conferences or published in scientific journals, however, only group data will be presented, individual data will not be used in this study.

**Who should I contact if I have any questions?** If you have any questions about the project, or do not understand some of the content of this information sheet, please feel free to contact the senior investigator Associate Professor Greg Murray, by email: gwm@swin.edu.au or phone (03) 9214 8300 for any additional explanation.
This project has been approved by Swinburne's Human Research Ethics Committee (SUHREC) in line with the National Statement on Ethical Conduct in Human Research. If you have any complaints or concerns about the conduct of this project, you may contact: Research Ethics Officer, Swinburne Research (H68),Swinburne University of Technology, PO Box 218, HAWTHORN VIC 3122,Tel (03) 9214 5218 or +61 3 9214 5218 or resethics@swin.edu.au.

**Thank you for your assistance in this important research. We really appreciate your co-operation and hope you find it an interesting experience.**

# APPENDIX C - Research Survey

***Note.*** The measures listed in Appendix C to Appendix J are identical to what participants were asked to complete in the research survey. However, scoring information was not included in the research survey. Furthermore, as it was an online survey the attached formatting is not what participants actually saw.

**Section 1: Your general biographical information**

Please answer the following questions as accurately as possible. Please note that the information you give will be treated in the strictest confidence.

a) Age: _____

b) Gender (*please tick*) Female ☐ Male ☐

c) Highest level of education obtained:

Primary ☐ Secondary ☐ Tertiary ☐ Postgraduate ☐ *(please tick one box only)*

d) What is your country of birth? (*Please state*) _____

e) In what country are you currently living? (*Please state*) _____

f) Please tick what best describes your ***current*** relationship status and its approximate duration.

| **Relationship Status** | ✓ | Month(s) | Year(s) |
|---|---|---|---|
| Married | | | |
| Separated | | | |
| Divorced | | | |
| Widowed | | | |
| Previously married, in current committed relationship | | | |
| Previously married, in current casual relationship | | | |
| Never married, in current committed relationship | | | |
| Never married, in current casual relationship | | | |
| Single | | | |
| Other, please state | | | |

g) Sexual orientation:

Heterosexual ☐

Bisexual ☐

Homosexual ☐

h) Please answer the following question to the best of your ability based on your own understanding of whether you felt the relationship was committed or casual.

- Approximate number of prior ***committed*** romantic relationships
- Approximate number of prior ***casual*** romantic relationships

i) Overall, how would you rate your ability to maintain romantic relationships? Please choose one item that best describes you.

| **1** **Poor** | **2** | **3** **Average** | **4** | **5** **Excellent** |
|---|---|---|---|---|

# APPENDIX D -TEMPS-Cyclothymic Scale

## Cyclothymic temperament Scale

**Personal characteristics**
We are interested in the kind of person you are. Please ***click on*** yes or no to the following items only if they apply to you for much of your life.

| | | YES | NO |
|---|---|---|---|
| **1.** | I often feel tired for no reason | | |
| **2.** | I get sudden shifts in mood and energy | | |
| **3.** | My moods and energy are either high or low, rarely in between | | |
| **4.** | My ability to think varies greatly from sharp to dull for no apparent reason | | |
| **5.** | I can really like someone a lot, and then completely lose interest in them | | |
| **6.** | I often start things and then lose interest before finishing them | | |
| **7.** | My mood often changes for no reason | | |
| **8.** | I constantly switch between being lively and sluggish | | |
| **9.** | I sometimes go to bed feeling great and wake up in the morning feeling life is not worth living | | |
| **10.** | I go back and forth between feeling overconfident and feeling unsure of myself | | |
| **11.** | I go back and forth between being outgoing and being withdrawn from others | | |
| **12.** | I feel all emotions intensely | | |
| **13.** | The way I see things is sometimes vivid, but at other times lifeless | | |
| **14.** | I am the kind of person who can be sad and happy at the same time | | |
| **15.** | I daydream a great deal about things that other people consider impossible to achieve | | |
| **16.** | I often have a strong urge to do outrageous things | | |
| **17.** | I am the kind of person who falls in and out of love easily | | |

The TEMPS-Cyclothymic scale is a dichotomous measure which requires either a yes or no response. Items are scored on a continuous scale ranging from 0 to 17. A ‘no’ response was scored as a 0 and a ‘yes’ response as a 1. More yes responses represent an increase in Cyclothymic temperament traits. More no responses represent a decrease in Cyclothymic temperament traits.

# APPENDIX E - ECR-R

## Experiences in Relationships-Revised Scale

**Experiences in close relationships**

The statements below concern how you feel in emotionally intimate relationships. We are interested in how you ***generally*** experience relationships, not just what is happening in a current relationship. Please respond to each statement by ***clicking on*** the appropriate number to indicate how much you agree or disagree with the statement.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| **Strongly Disagree** | **Disagree** | **Disagree somewhat** | **Neutral** | **Agree somewhat** | **Agree** | **Strongly Agree** |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1. I am afraid I will lose the love of others. | **1** | **2** | **3** | **4** | **5** | **6** | **7** |
| 2. My partner really understands me and my needs. | **1** | **2** | **3** | **4** | **5** | **6** | **7** |
| 3. I often worry that my partner will not want to stay with me. | **1** | **2** | **3** | **4** | **5** | **6** | **7** |
| 4. It's easy for me to be affectionate with my partner. | **1** | **2** | **3** | **4** | **5** | **6** | **7** |
| 5. I often worry that others don't really love me. | **1** | **2** | **3** | **4** | **5** | **6** | **7** |
| 6. I find it easy to depend on romantic partners. | **1** | **2** | **3** | **4** | **5** | **6** | **7** |
| 7. I worry that romantic partners won't care about me as much as I care about them. | **1** | **2** | **3** | **4** | **5** | **6** | **7** |
| 8. I feel comfortable depending on romantic partners. | **1** | **2** | **3** | **4** | **5** | **6** | **7** |
| 9. I often wish that my partner's feelings for me were as strong as my feelings for him or her. | **1** | **2** | **3** | **4** | **5** | **6** | **7** |
| 10. I talk things over with my partner. | **1** | **2** | **3** | **4** | **5** | **6** | **7** |
| 11. I worry a lot about my relationships. | **1** | **2** | **3** | **4** | **5** | **6** | **7** |
| 12. I tell my partner just about everything. | **1** | **2** | **3** | **4** | **5** | **6** | **7** |
| 13. When my partner is out of sight, I worry that he or she might be interested in someone else. | **1** | **2** | **3** | **4** | **5** | **6** | **7** |
| 14. When I show my feelings for romantic partners, I'm afraid they will not feel the same about me. | **1** | **2** | **3** | **4** | **5** | **6** | **7** |
| 15. I rarely worry about my partner leaving me. | **1** | **2** | **3** | **4** | **5** | **6** | **7** |
| 16. My romantic partner makes me doubt myself. | **1** | **2** | **3** | **4** | **5** | **6** | **7** |
| 17. I do not often worry about being abandoned | **1** | **2** | **3** | **4** | **5** | **6** | **7** |
| 18. I find that my partner(s) don't want to get as close as I would like. | **1** | **2** | **3** | **4** | **5** | **6** | **7** |
| 19. It helps to turn to my romantic partner in times of need. | **1** | **2** | **3** | **4** | **5** | **6** | **7** |
| 20. Sometimes romantic partners change their feelings about me for no apparent reason. | **1** | **2** | **3** | **4** | **5** | **6** | **7** |
| 21. I find it relatively easy to get close to my partner. | **1** | **2** | **3** | **4** | **5** | **6** | **7** |
| 22. My desire to be very close sometimes scares people away. | **1** | **2** | **3** | **4** | **5** | **6** | **7** |
| 23. It's not difficult for me to get close to my partner. | **1** | **2** | **3** | **4** | **5** | **6** | **7** |
| 24. I'm afraid that once a romantic partner gets to know me, he or she won't like who I really am. | **1** | **2** | **3** | **4** | **5** | **6** | **7** |
| 25. I usually discuss my problems and concerns with my partner. | **1** | **2** | **3** | **4** | **5** | **6** | **7** |
| 26. It makes me mad that I don't get the affection and support I need from my partner. | **1** | **2** | **3** | **4** | **5** | **6** | **7** |
| 27. I find it difficult to allow myself to depend on romantic partners. | **1** | **2** | **3** | **4** | **5** | **6** | **7** |
| 28. I am nervous when partners get too close to me. | **1** | **2** | **3** | **4** | **5** | **6** | **7** |
| 29. I worry that I won't measure up to other people. | **1** | **2** | **3** | **4** | **5** | **6** | **7** |
| 30. My partner only seems to notice me when I'm angry. | **1** | **2** | **3** | **4** | **5** | **6** | **7** |
| 31. I prefer not to show a partner how I feel deep down. | **1** | **2** | **3** | **4** | **5** | **6** | **7** |
| 32. I feel comfortable sharing my private thoughts and feelings with my partner. | **1** | **2** | **3** | **4** | **5** | **6** | **7** |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 33. I am very comfortable being close to romantic partners. | **1** | **2** | **3** | **4** | **5** | **6** | **7** |
| 34. I don't feel comfortable opening up to romantic partners. | **1** | **2** | **3** | **4** | **5** | **6** | **7** |
| 35. I prefer not to be close to romantic partners. | **1** | **2** | **3** | **4** | **5** | **6** | **7** |
| 36. I get uncomfortable when a romantic partner wants to be very close. | **1** | **2** | **3** | **4** | **5** | **6** | **7** |

***Scoring Information***: The first 18 items of the ECR-R comprise the anxious attachment dimension (ECR-anxious). Items 19-36 comprise the avoidant attachment dimension (ECR-avoidant). The order in which these items are presented can be randomized. Each item is rated on a 7-point scale where 1= strongly disagree and 7= strongly agree. To obtain a score for *anxious attachment* (ECR-anxious), please average a person's responses to items 1-18. However, because items 9 and 11 are "reverse keyed" (i.e., high numbers represent low anxiety rather than high anxiety), you'll need to reverse the answers to those questions before averaging the responses. (If someone answers with a "6" to item 9, you'll need to re-key it as a 2 before averaging). To obtain a score for *avoidant attachment* (ECR-avoidant), please average a person's response to items 19 - 36. Items 20, 22, 26, 27, 28, 29, 30, 31, 33, 34, 35 and 36 will need to be reversed keyed before you compute this average. Low scores on both dimensions are indicative of a secure attachment.

# APPENDIX F - RAS

## Relationship Assessment Scale

The following questions are concerned with how satisfied you ***generally*** feel in an intimate relationship. For each question we simply want you to indicate which of the five alternatives best describes you, or your preferences, by ***clicking on*** the appropriate number.

| | | | | | |
|---|---|---|---|---|---|
| 1. How well does your partner meet your needs? | **1 Poorly** | **2** | **3 Average** | **4** | **5 Extremely well** |
| 2. In general, how satisfied are you with your relationship? | **1 unsatisfied** | **2** | **3 Average** | **4** | **5 Extremely satisfied** |
| 3. How good is your relationship compared to most? | **1 Poor** | **2** | **3 Average** | **4** | **5 Excellent** |
| 4. How often do you wish you hadn't gotten into this relationship? | **1 Never** | **2** | **3 Average** | **4** | **5 Very often** |
| 5. To what extent has your relationship met your original expectations? | **1 Hardly at all** | **2** | **3 Average** | **4** | **5 Completely** |
| 6. How much do you love your partner? | **1 Not Much** | **2** | **3 Average** | **4** | **5 Very Much** |
| 7. How many problems are there in your relationship? | **1 Very Few** | **2** | **3 Average** | **4** | **5 Many** |

***Scoring Information*:** After reverse scoring items 4 and 7, items are summed for a total score. Scores can range from 7 (low relationship satisfaction) to 35 (high relationship satisfaction). You can also add responses together and divide by 7.

# APPENDIX G - sGBI: GBI-hypomania & GBI-depression

## General Behavior Inventory-short version

The next set of statements refers to experiences that people may have in their everyday lives. By ***clicking*** a response from the options provided, please indicate the extent to which you believe these statements accurately describe you.

| | **Never or hardly ever** | **Sometimes** | **Often** | **Very often or almost constantly** |
|---|---|---|---|---|
| 1. Have there been long periods in your life when you felt sad, depressed, or irritable most of the time? | 1 | 2 | 3 | 4 |
| 2. Have you had periods of extreme happiness and high energy lasting several days or more when what you saw, heard, smelled, tasted, or touched seemed vivid or intense? | 1 | 2 | 3 | 4 |
| 3. Have there been times of several days or more when you really got down on yourself and felt worthless? | 1 | 2 | 3 | 4 |
| 4. Have you had periods of extreme happiness and intense energy (clearly more than your usual self) when, for several days or more, it took you over an hour to get to sleep at night? | 1 | 2 | 3 | 4 |
| 5. Have you had long periods in which you felt you couldn't enjoy life as easily as other people? | 1 | 2 | 3 | 4 |
| 6. Have you had periods lasting several days or more when you felt depressed or irritable, and then other periods of several days or more when you felt extremely high, elated, and overflowing with energy? | 1 | 2 | 3 | 4 |
| 7. Have there been periods lasting several days or more when you were so down in the dumps that you thought you might never snap out of it? | 1 | 2 | 3 | 4 |
| 8. Have you had periods of extreme happiness and intense energy lasting several days or more when you also felt much more anxious or tense (jittery, nervous, uptight) than usual (other than related to the menstrual cycle)? | 1 | 2 | 3 | 4 |
| 9. Have there been times when you looked back over your life and could see only failures or hardships? | 1 | 2 | 3 | 4 |
| 10. Have there been times lasting several days or more when you felt you must have lots of excitement, and you actually did a lot of new or different things? | 1 | 2 | 3 | 4 |
| 11. Have you had periods when it seemed that the future was hopeless and things could not improve? | 1 | 2 | 3 | 4 |
| 12. Have there been periods of several days or more when your friends or family told you that you seemed unusually happy or high, clearly different from your usual self or from a typical good mood? | 1 | 2 | 3 | 4 |

| | | | | |
|---|---|---|---|---|
| 13. Have there been times when you have hated yourself or felt that you were stupid, ugly, unlovable, or useless? | 1 | 2 | 3 | 4 |
| 14. Have there been periods when, although you were feeling unusually happy and intensely energetic, almost everything got on your nerves and made you irritable or angry (other than related to your menstrual cycle)? | 1 | 2 | 3 | 4 |
| 15. Have there been times of several days or more when you were so sad it was quite painful or you felt that you couldn't stand it? | 1 | 2 | 3 | 4 |
| 16. Have you experienced periods of several days or more when, although you were feeling unusually happy and intensely energetic (clearly more than your usual self), you also were physically restless, unable to sit still, and had to keep moving or jumping from one activity to another? | 1 | 2 | 3 | 4 |
| 17. Have there been times of several days or more when you were so down that nothing (not even friends or good news) could cheer you up? | 1 | 2 | 3 | 4 |
| 18. Have there been times of a couple of days or more when you felt that you were a very important person or that your abilities or talents were better than most other people's? | 1 | 2 | 3 | 4 |
| 19. Have there been times when you have felt that you would be better off dead? | 1 | 2 | 3 | 4 |
| 20. Have there been times of several days or more when you did not feel the need for sleep and were able to stay awake and alert for much longer than usual because you were full of energy? | 1 | 2 | 3 | 4 |

***Scoring Information:*** The sGBI includes 20 Likert-type items reflective of hypomania and depression proneness. Each item is rated on four point scale where 1= never or hardly ever, 2= sometimes, 3= often and 4= very often or almost constantly. Scores can range from 20 (low proneness) to 80 (high proneness). Items that are rated as '1' or '2' were considered to be 'absent.' Items scored as a '3' or a '4' were considered to be 'present.'

# APPENDIX H - CRS

## Cyclothymic Relationship Scale

The following items contain phrases describing people's typical behaviours. For each question we simply want you to indicate which of the five alternatives best describes you generally by ***clicking on*** the appropriate number.

| | 1<br>Very inaccurate | 2<br>Moderately inaccurate | 3<br>Neither inaccurate nor accurate | 4<br>Moderately accurate | 5<br>Very accurate |
|---|---|---|---|---|---|
| 1. I alternate between perceiving my relationship as both disastrous and perfectly ideal. | **1** | **2** | **3** | **4** | **5** |
| 2. I alternate between feeling responsible for any problems in my relationship to blaming my partner for everything. | **1** | **2** | **3** | **4** | **5** |
| 3. I get easily annoyed, snappy and irritated with my partner and then quickly feel admiration, love and affection. | **1** | **2** | **3** | **4** | **5** |
| 4. I alternate between seeing my relationship as full of joy & excitement, and then it seems dull and boring. | **1** | **2** | **3** | **4** | **5** |
| 5. I alternate between wanting sex all the time, and then I don't want sex at all. | **1** | **2** | **3** | **4** | **5** |
| 6. I alternate between being very talkative with my partner, and then at times I have nothing to say. | **1** | **2** | **3** | **4** | **5** |
| 7. I alternate between wanting to be close to my partner, and then I distance myself from them altogether. | **1** | **2** | **3** | **4** | **5** |
| 8. I take things out on my partner, and then quickly try to make it up to them. | **1** | **2** | **3** | **4** | **5** |
| 9. I have loving and angry feelings for my partner at the same time. | **1** | **2** | **3** | **4** | **5** |
| 10. I alternate between feeling committed to my relationship one week then want to break it off the next. | **1** | **2** | **3** | **4** | **5** |
| 11. I alternate between sharing my feelings with my partner in times of need and keeping my feelings to myself. | **1** | **2** | **3** | **4** | **5** |
| 12. I alternate between saying hurtful things to my partner and then I frequently compliment them. | **1** | **2** | **3** | **4** | **5** |
| 13. I alternate between wondering why my partner would want to be with me, and then thinking they are lucky to have me. | **1** | **2** | **3** | **4** | **5** |

***Scoring Information*:** The 13 CRS items are simply added together to obtain an overall total score. Each item is rated on a 5-point scale where 1= very inaccurate and 5= very accurate. Scores can range from 13 (low Cyclothymic moodiness in the context of a close relationship) to 65 (high Cyclothymic moodiness in the context of a close relationship).

**Cognitive items:**

Item 1: I alternate between perceiving my relationship as both disastrous and perfectly ideal.

Item 4: I alternate between seeing my relationship as full of joy & excitement, and then it seems dull and boring.

Item 13: I alternate between wondering why my partner would want to be with me, and then thinking they are lucky to have me.

**Emotional items:**

Item 2: I alternate between feeling responsible for any problems in my relationship to blaming my partner for everything.

Item 3: I get easily annoyed, snappy and irritated with my partner and then quickly feel admiration, love and affection.

Item 9: I have loving and angry feelings for my partner at the same time.

Item 10: I alternate between feeling committed to my relationship one week then want to break it off the next.

Item 11: I alternate between sharing my feelings with my partner in times of need and keeping my feelings to myself.

**Behavioural items:**

Item 5: I alternate between wanting sex all the time, and then I don't want sex at all.

Item 6: I alternate between being very talkative with my partner, and then at times I have nothing to say.

Item 7: I alternate between wanting to be close to my partner, and then I distance myself from them altogether.

Item 8: I take things out on my partner, and then quickly try to make it up to them.

Item 12: I alternate between saying hurtful things to my partner and then I frequently compliment them.

# APPENDIX I - SWLS

## Satisfaction with Life Scale

Below are five statements with which you may agree or disagree. Please indicate your agreement by ***clicking on*** a response from the options provided.

| | **Strongly Disagree** | **Disagree** | **Slightly Disagree** | **Neither Agree or Disagree** | **Slightly Agree** | **Agree** | **Strongly Agree** |
|---|---|---|---|---|---|---|---|
| 1. In most ways my life is close to my ideal. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. The conditions of my life are excellent. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. I am satisfied with life | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. So far I have gotten the important things I want in life. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. If I could live my life over, I would change almost nothing. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

***Scoring information:*** Responses are simply added together to obtain a total score. Each item is rated on a 7-point scale where 1=strongly disagree and 7= strongly agree.Scores can range from 5 (low satisfaction) to 35 (high satisfaction).

**30 – 35 Very high score; highly satisfied**

Respondents who score in this range love their lives and feel that things are going very well. Their lives are not perfect, but they feel that things are about as good as lives get. Furthermore, just because the person is satisfied does not mean she or he is complacent. In fact, growth and challenge might be part of the reason the respondent is satisfied. For most people in this high-scoring range, life is enjoyable, and the major domains of life are going well – work or school, family, friends, leisure, and personal development.

**25- 29 High score**

Individuals who score in this range like their lives and feel that things are going well. Of course their lives are not perfect, but they feel that things are mostly good. Furthermore, just because the person is satisfied does not mean she or he is complacent. In fact, growth and challenge might be part of the reason the respondent is satisfied. For most people in this high-scoring range, life is enjoyable, and the major domains of life are going well – work or school, family, friends, leisure, and personal development. The person may draw motivation from the areas of dissatisfaction.

**20 – 24 Average score**

The average of life satisfaction in economically developed nations is in this range – the majority of people are generally satisfied, but have some areas where they very much would like some improvement. Some individuals score in this range because they are mostly satisfied with most areas of their lives but see the need for some improvement in each area.

Other respondents score in this range because they are satisfied with most domains of their lives, but have one or two areas where they would like to see large improvements. A person scoring in this range is normal in that they have areas of their lives that need improvement. However, an individual in this range would usually like to move to a higher level by making some life changes.

**15 – 19 slightly below average in life satisfaction**

People who score in this range usually have small but significant problems in several areas of their lives, or have many areas that are doing fine but one area that represents a substantial problem for them. If a person has moved temporarily into this level of life satisfaction from a higher level because of some recent event, things will usually improve over time and satisfaction will generally move back up. On the other hand, if a person is chronically slightly dissatisfied with many areas of life, some changes might be in order. Sometimes the person is simply expecting too much, and sometimes life changes are needed. Thus, although temporary dissatisfaction is common and normal, a chronic level of dissatisfaction across a number of areas of life calls for reflection. Some people can gain motivation from a small level of dissatisfaction, but often dissatisfaction across a number of life domains is a distraction, and unpleasant as well.

**10 – 14 Dissatisfied**

People who score in this range are substantially dissatisfied with their lives. People in this range may have a number of domains that are not going well, or one or two domains that are going very badly. If life dissatisfaction is a response to a recent event such as bereavement, divorce, or a significant problem at work, the person will probably return over time to his or her former level of higher satisfaction. However, if low levels of life satisfaction have been chronic for the person, some changes are in order – both in attitudes and patterns of thinking, and probably in life activities as well. Low levels of life satisfaction in this range, if they persist, can indicate that things are going badly and life alterations are needed. Furthermore, a person with low life satisfaction in this range is sometimes not functioning well because their unhappiness serves as a distraction. Talking to a friend, member of the clergy, counsellor, or other specialist can often help the person get moving in the right direction, although positive change will be up the person.

**5 – 9 Extremely Dissatisfied**

Individuals who score in this range are usually extremely unhappy with their current life. In some cases this is in reaction to some recent bad event such as widowhood or unemployment. In other cases, it is a response to a chronic problem such as alcoholism or addiction. In yet other cases the extreme dissatisfaction is a reaction due to something bad in life such as recently having lost a loved one. However, dissatisfaction at this level is often due to dissatisfaction in multiple areas of life. Whatever the reason for the low level of life satisfaction, it may be that the help of others are needed – a friend or family member, counselling with a member of the clergy, or help from a psychologist or other counsellor. If the dissatisfaction is chronic, the person needs to change, and often others can help.

Part that is common to each category

To understand life satisfaction scores, it is helpful to understand some of the components that go into most people's experience of satisfaction. One of the most important influences on happiness is social relationships. People who score high on life satisfaction tend to have close and supportive family and friends, whereas those who do not have close friends and family are more likely to be dissatisfied. Of course the loss of a close friend or family member can cause dissatisfaction with life, and it may take quite a time for the person to bounce back from the loss.
Another factor that influences the life satisfaction of most people is work or school, or performance in an important role such as homemaker or grandparent. When the person enjoys his or her work, whether it is paid or unpaid work, and feels that it is meaningful and important, this contributes to life satisfaction. When work is going poorly because of bad circumstances or a poor fit with the person's strengths, this can lower life satisfaction. When a person has important goals, and is failing to make adequate progress toward them, this too can lead to life dissatisfaction.

A third factor that influences the life satisfaction of most people is personal – satisfaction with the self, religious or spiritual life, learning and growth, and leisure. For many people these are sources of satisfaction. However, when these sources of personal worth are frustrated, they can be powerful sources of dissatisfaction. Of course there are additional sources of satisfaction and dissatisfaction – some that are common to most people such as health, and others that are unique to each individual. Most people know the factors that lead to their satisfaction or dissatisfaction, although a person's temperament – a general tendency to be happy or unhappy – can colour their responses.

There is no one key to life satisfaction, but rather a recipe that includes a number of ingredients. With time and persistent work, people's life satisfaction usually goes up when they are dissatisfied. People who have had a loss recover over time. People who have a dissatisfying relationship or work often make changes over time that will increase their dissatisfaction. One key ingredient to happiness, as mentioned above, is social relationships, and another key ingredient is to have important goals that derive from one's values, and to make progress toward those goals. For many people it is important to feel a connection to something larger than oneself. When a person tends to be chronically dissatisfied, they should look within themselves and ask whether they need to develop more positive attitudes to life and the world.

# APPENDIX J - MDQ

## Mood Disorder Questionnaire

For each of the following questions we simply want you to ***click on*** yes or no. Please answer each question to the best of your ability.

| **1. Has there ever been a period in your life when you were not your usual self and……** | **YES** | **NO** |
|---|---|---|
| you felt so good or so hyper that other people thought you were not your normal self or you were so hyper that you got into trouble? | | |
| you were so irritable that you shouted at people or started fights or arguments? | | |
| you felt much more self-confident than usual? | | |
| you got much less sleep than usual and found you didn't really miss it? | | |
| you were much more talkative or spoke much faster than usual? | | |
| thoughts raced through your head or you couldn't slow your mind down? | | |
| you were so easily distracted by things around you that you had trouble concentrating or staying on track? | | |
| you had much more energy than usual? | | |
| you were much more social or outgoing than usual, for example, you telephoned friends in the middle of the night? | | |
| you were much more interested in sex than usual? | | |
| you did things that were unusual for you or that people might have thought were excessive, foolish, or risky? | | |
| spending money got you or your family into trouble? | | |
| **2. If you checked YES to more than one of the above, have several of these ever happened during the same period of time?** | | |
| **3. How much of a problem did any of these cause you- like being unable to work: having family, money or legal troubles; getting into arguments or fights? *Please circle one response only*** | | |
| **No problem Minor problem Moderate Problem Serious Problem** | | |
| **4. Have any of your blood relatives (i.e. children, siblings, parents, grandparents, aunts, uncles) had manic-depressive illness or bipolar disorder?** | | |
| **5. Has a health professional ever told you that you have manic-depressive illness or bipolar disorder?** | | |

***Scoring Information:*** The MDQ screens for Bipolar Spectrum Disorder, (which includes Bipolar I, Bipolar II and Bipolar NOS). The MDQ was developed by a team of psychiatrists, researchers and consumer advocates to address a critical need for timely and accurate diagnosis of bipolar disorder; which can be fatal if left untreated. The questionnaire takes about five minutes to complete, and can provide important insights into diagnosis and

treatment. Clinical trials have indicated that the MDQ has a high rate of accuracy; it is able to identify seven out of ten people who have bipolar disorder and screen out nine out of ten people who do not.

A recent National DMDA survey revealed that nearly 70% of people with bipolar disorder had received at least one misdiagnosis and many had waited more than ten years from the onset of their symptoms before receiving a correct diagnosis. National DMDA hopes that the MDQ will shorten this delay and help more people to get the treatment they need, when they need it.

If the patient answers:

1. "Yes" to seven or more of the 13 items in question number 1;

   AND

2. "Yes" to question number 2;

   AND

3. "Moderate" or "Serious" to question number 3;

you have a positive screen. All three of the criteria above should be met. A positive screen should be followed by a comprehensive medical evaluation for Bipolar Spectrum Disorder.

# APPENDIX K- Ethics Approval

To: Mrs Sarah Elizabeth Fraser for A/Prof G Murray FLSS

Dear Sarah,

SUHREC Project 2010/137 Mood variability and experiences in close relationships
A/Prof G Murray FLSS; Mrs Sarah Elizabeth Fraser

Approved Duration 22/07/2010 To 31/01/2011 [Adjusted]

I refer to the ethical reviews of the above project protocol undertaken by Swinburne's Human Research Ethics Committee (SUHREC). Your responses to the reviews, as e-mailed on 14/16 July 2010, were put to and approved by SUHREC delegate(s).

I am pleased to advise that, as submitted to date, the project has approval to proceed in line with standard on-going ethics clearance conditions here outlined. All human research activity undertaken under Swinburne auspices must conform to Swinburne and external regulatory standards, including the National Statement on Ethical Conduct in Human Research and with respect to secure data use, retention and disposal.

- The named Swinburne Chief Investigator/Supervisor remains responsible for any personnel appointed to or associated with the project being made aware of ethics clearance conditions, including research and consent procedures or instruments approved. Any change in chief investigator/supervisor requires timely notification and SUHREC endorsement.

- The above project has been approved as submitted for ethical review by or on behalf of SUHREC. Amendments to approved procedures or instruments ordinarily require prior ethical appraisal/ clearance. SUHREC must be notified immediately or as soon as possible thereafter of (a) any serious or unexpected adverse effects on participants and any redress measures; (b) proposed changes in protocols; and (c) unforeseen events which might affect continued ethical acceptability of the project.

- At a minimum, an annual report on the progress of the project is required as well as at the conclusion (or abandonment) of the project.

- A duly authorised external or internal audit of the project may be undertaken at any time.

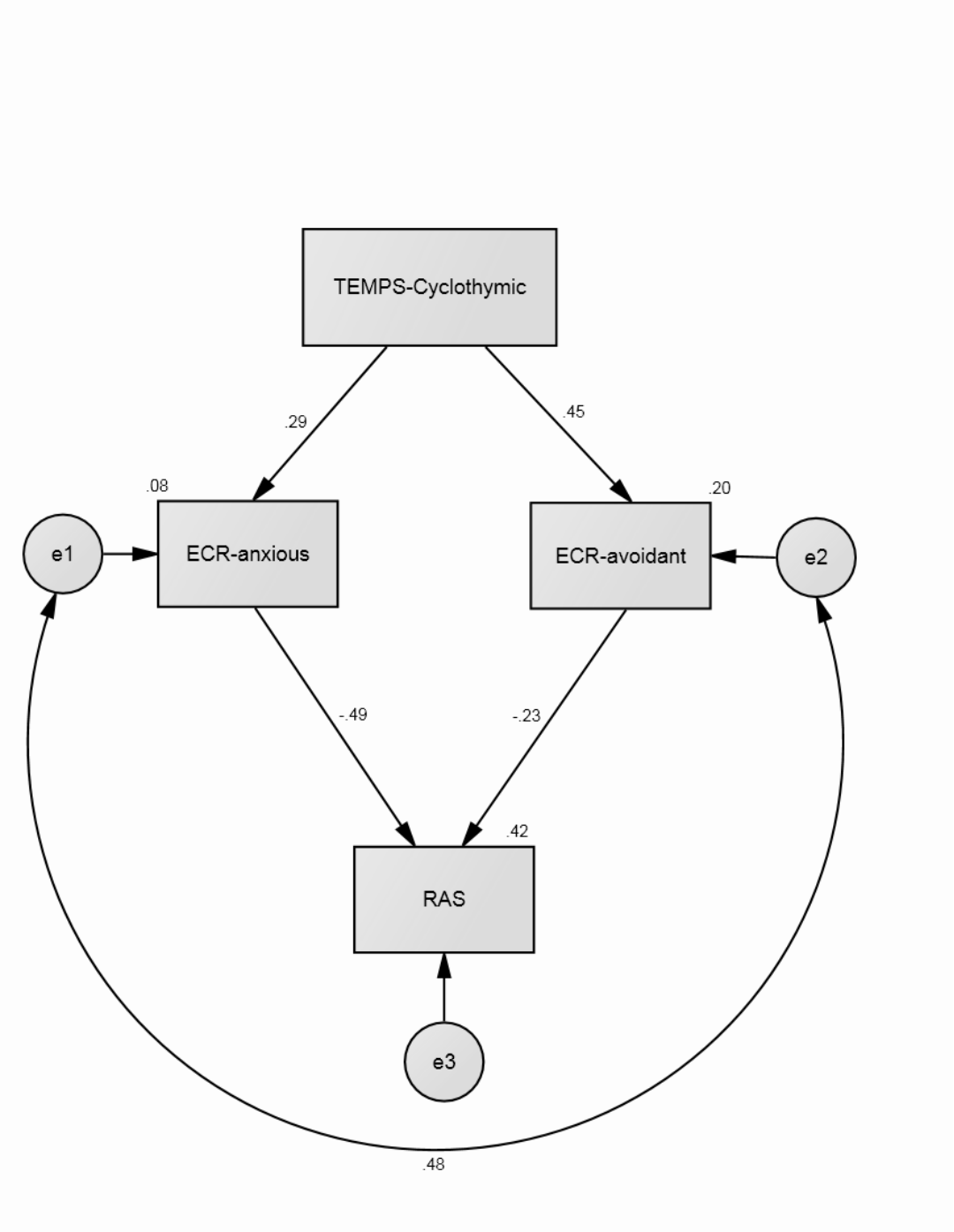
Please contact me if you have any queries about the ethical review process, citing the SUHREC project number. Copies of clearance emails should be retained as part of project record-keeping.

Best wishes for the project.
Yours sincerely

Ann Gaeth
for Keith Wilkins
Secretary, SUHREC
**********
Ann Gaeth, PhD
Administrative Officer (Research Ethics)
Swinburne Research (H68)
Swinburne University of Technology
P.O. Box 218,HAWTHORN VIC 3122
Tel: +61 3 9214 5935
Fax: +61 3 9214 5267

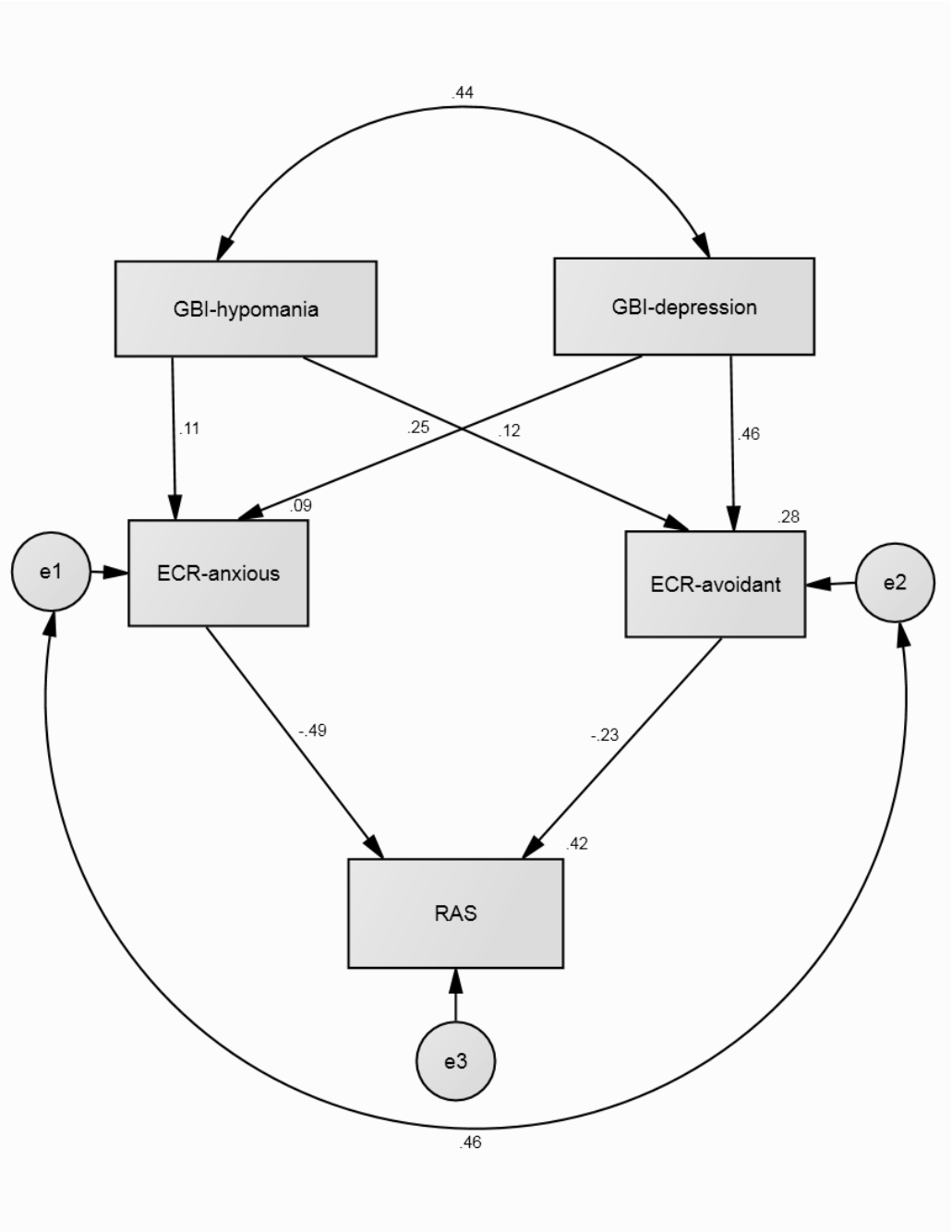
## APPENDIX L – Three SEM models for *n* = 283 participants in a relationship

Additional analyses that involved only those participants in a relationship (*n* = 283: married, in a committed or casual relationship) showed that the questionable application of the RAS amongst people not in a relationship had little impact on findings because, a) most participants (78%) were in fact in a relationship, and b) the findings did not change when analyses were restricted to those participants for whom the RAS is arguably more valid.



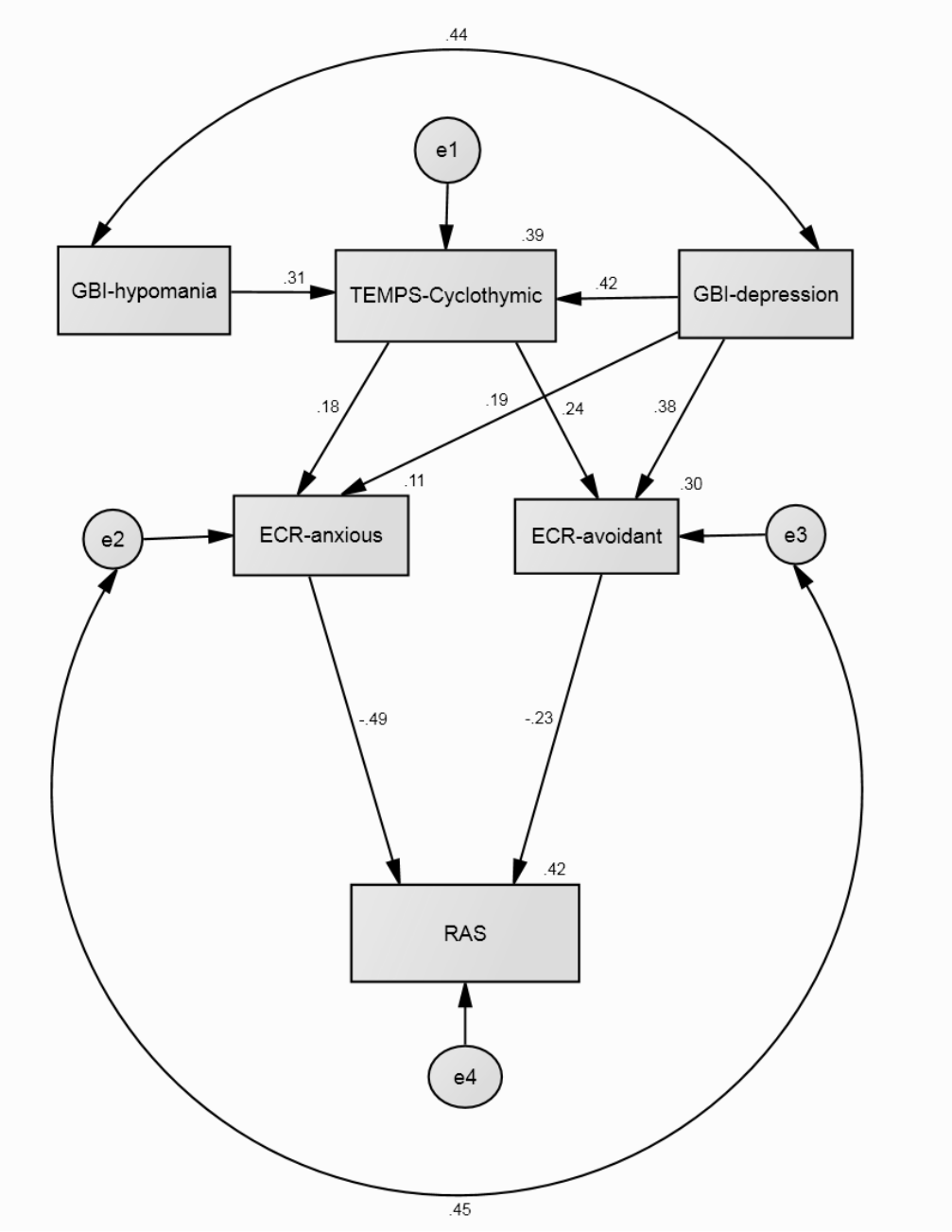

*Path Model 1:* Final model of theorised mediation effect between Cyclothymic temperament and relationship satisfaction, n = 283.

N.B. Model 1 was good fit to the data, $\chi^2$ (1, *N*= 283) = .363, *p* = .54, CMIN/DF = .363, RMSEA = .00, TLI = 1.01, CFI = 1.00., AIC = 26.36.




*Path Model 2:* Final model of theorised mediation effect between hypomania and depression proneness and relationship satisfaction, $n = 283$.

N.B. Model 2 was a good fit to the data, $\chi^2$ (2, $N$= 283) = 1.00, $p$ = .95, CMIN/DF = .05, RMSEA = .00, TLI = 1.01, CFI = 1.00, AIC = 36.10.




*Path Model 3:* Final model of theorised mediation effect between Cyclothymic temperament, hypomania and depression proneness and relationship satisfaction, $n$ = 283.

N.B. Model 3 was a good fit to the data, $\chi^2$ (5, $N$= 283) = 1.91, $p$ = .86, CMIN/DF = .38, RMSEA = .00, TLI = 1.01, CFI = 1.00, AIC = 45.91.

## APPENDIX M – Two exploratory moderating models (1) *n* = 283 participants in a relationship (2) *n*= 359 participants (irrespective of relationship status)

The current study aimed to investigate the process or mechanism by which Cyclothymic temperament influenced relationship satisfaction. Investigating attachment as a moderating variable would seek to explore the variables impact on the direction and/or strength of the relationship between Cyclothymic temperament and relationship satisfaction.

It is definitely possible that insecure attachment moderates the association between Cyclothymic temperament and relationship satisfaction. Indeed, it is also possible that there is alternate mediating or moderating variables that predict relationship dissatisfaction, and that a longer mediation chain involving more than one mediator variable may exist, or that the intensity of mediated effects is dependent on (unmeasured) moderating variables (Muller, Judd, & Yzerbyt, 2005). The full complexity of investigating mediation, moderation and moderated mediation was beyond the scope of the current study.

For completeness two alternative moderation models were tested. Firstly, a moderating model was tested that included all participants in the analyses (irrespective of relationship status).

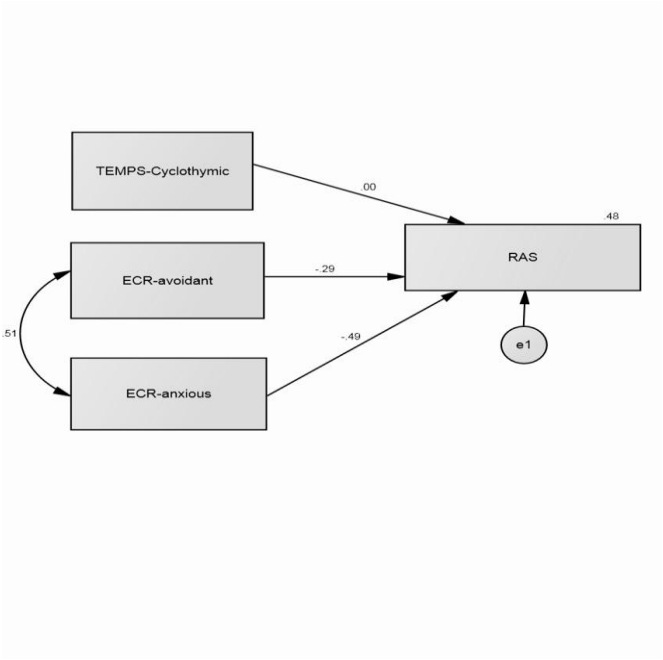



*Fig 1.* Theorised moderating effect including all participants.

The structural model shown in figure 1 generated poor fit, $\chi^2$ (2, *N*= 359) = 82.78, *p* = .00, CMIN/DF = 41.39, RMSEA = .33, TLI = .42, CFI = .80, AIC = 106.78. Therefore, an additional structural model including only those participants who were in a relationship (i.e., married and those in a committed or casual relationship) was examined.

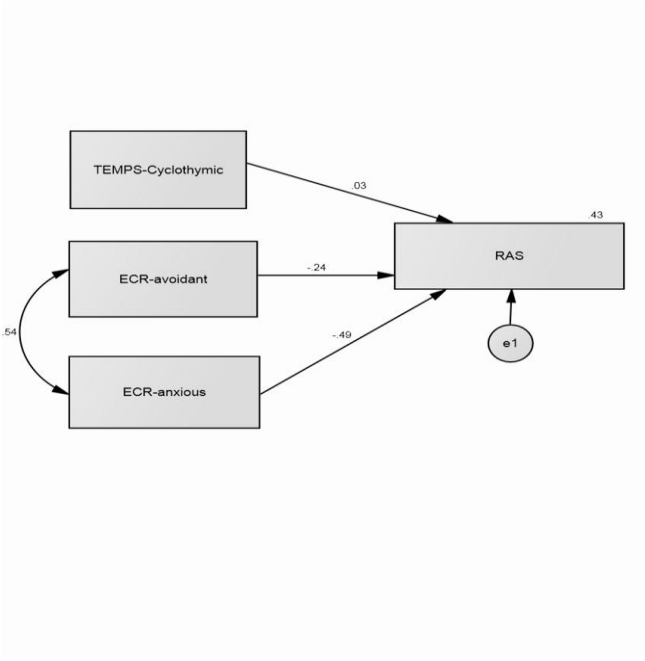



*Fig 2.* Theorised moderation effect including only participants in a relationship.

Again, the moderating model shown in figure 2 generated poor fit indices, $\chi^2$ (1, *N*= 283) = 64.66, *p* = .00, CMIN/DF = 32.33, RMSEA = .33, TLI = .38, CFI = .79, AIC = 88.66.