Borderline Personality Traits and Emotion Regulation Strategies in Adolescents: The Role of Implicit Theories

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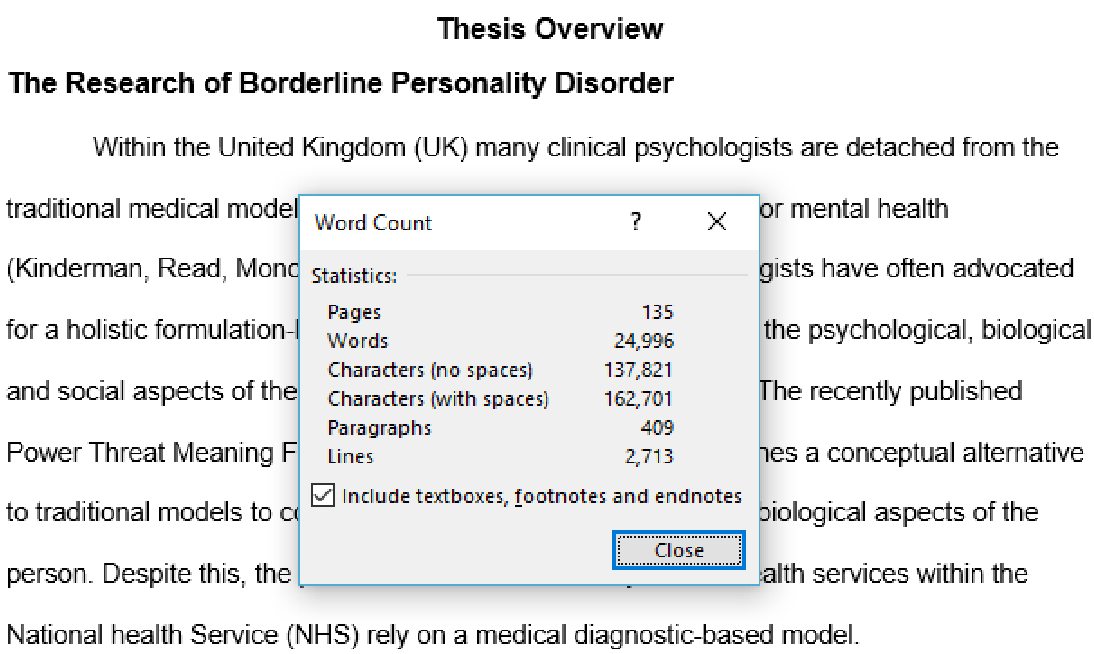
Thesis Overview
The Research of Borderline Personality Disorder
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Thesis Overview

The Research of Borderline Personality Disorder

Within the United Kingdom (UK) many clinical psychologists are detached from the traditional medical model, which imposed diagnostic categories for mental health (Kinderman, Read, Moncrieff, & Bentall, 2013). Clinical psychologists have often advocated for a holistic formulation-based approach, which can incorporate the psychological, biological and social aspects of the individual (Johnstone & Dallos, 2014). The recently published Power Threat Meaning Framework (Johnstone et al., 2018) outlines a conceptual alternative to traditional models to combine psychological, sociological and biological aspects of the person. Despite this, the predominant models in many mental health services within the National health Service (NHS) rely on a medical diagnostic-based model.

Many of these diagnoses can be stigmatising for the individual but personality disorder arguably remains the most controversial of all mental health diagnoses. Borderline Personality Disorder (BPD) has been defined in the most recent version of the Diagnostic and Statistical Manual for Mental Disorders (DSM5) as a pervasive pattern of instability in affect, interpersonal relationships and impulsivity (American Psychiatric Association, 2013). To get a diagnosis based on the DSM5 criteria, people must meet at least five of the nine defined indicators for BPD. The wide range of subsequent combinations that form a diagnosis of BPD means that two people meeting criteria for a diagnosis may only have one symptom in common (Biskin & Paris, 2012). The most recent version of the International Classification of Diseases (ICD-11; World Health Organisation, 2018) has moved from a categorical approach to diagnosis to a continuum-based approach for personality disorder. The term BPD, however, is still consistently used in healthcare and even in reference to adolescents.

The diagnosis is even more controversial in adolescents due to uncertainty around the development of identity at this age (Shapiro, 1990) and the impact that this stigmatising label may have on a person going forward (Rusch et al., 2006). Research suggests

however, that BPD traits are present in adolescents (Johnson, Cohen, Kasen, Skodol, & Oldham, 2008) and may predict lifetime chronicity and outcome (McGorry, 2013). Whilst some people may find a diagnosis to be helpful because it explains their difficulties and provides a direction for treatment, others find labels to be a barrier to recovery (British Psycholgoical Society, 2015). The author has reservations about accepting use of this medicalised language but is aware that we cannot ignore that difficulties may exist in young people that can have long term costs to their development and wellbeing. To understand these difficulties and provide early interventions that are effective for young people, it is difficult to not use categories associated with the difficulties. We acknowledge however, the need for the use of this language to be challenged in practice.

Thesis Overview

There are two separate papers contained within this thesis. The first is a systematic review, which aimed to assess the association of rumination with dysregulated behaviours that are often present in people with a diagnosis of BPD. These associations were specifically assessed in children and adolescents under the age of 19 years. A systematic search of three databases resulted in 30 studies being found which met all of the inclusion and exclusion criteria. These studies measured numerous types of rumination and dysregulated behaviours. The studies were assessed against a quality framework, which revealed varying levels of quality across the studies. As there were limited studies of high quality and a paucity of evidence for the different types of rumination and behaviours assessed, it was difficult to draw conclusive results from the review. Methodological issues and suggestions for future research were discussed.

The second paper in this thesis is an empirical study which sought to understand how adolescents' beliefs about emotions' malleability is associated with Borderline Personality traits and cognitive emotion regulation strategies. This study tested whether adolescents in a mental health inpatient setting would increasingly use cognitive emotion regulation strategies that are generally accepted as more helpful (i.e. cognitive reappraisal)

versus those viewed as unhelpful (i.e. rumination). Whilst rumination can at times be helpful, for example dwelling on past mistakes may help a person adapt and improve for similar scenarios in future, higher levels of rumination is generally considered to be more unhelpful for emotion regulation (Kring & Werner, 2004). Higher use of cognitive reappraisal on the other hand, is generally considered to be a more helpful strategy and associated with better wellbeing (Haga, Kraft & Corby, 2009). The importance of beliefs about emotions in mental health was highlighted through the results of this study. The use of virtual reality for psychoeducational purposes was shown to be beneficial for this population. Relevant literature is highlighted throughout the discussion and the limitations of the research are discussed.

The information in the two chapters is supplemented by material in the appendices for purpose of examination, which includes publication guidance and documents provided to participants.

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Chapter 1: Systematic literature review

The association between rumination and dysregulated behaviours observed in Borderline Personality Disorder: A systematic review of the literature in children and adolescents

Jane McLachlan

Prepared in accordance with guidelines for submission to European Journal of Personality Disorders (Appendix 1)

Abstract

Background: Rumination is a key component of many mental health difficulties. A recent theoretical model, the emotional cascade model, has implicated rumination in the externalising behaviours often seen in mental health difficulties such as Borderline Personality Disorder (BPD).

Aim: The aim of this systematic review was to assess associations of different types of rumination with the dysregulated behaviours often linked with Borderline Personality Disorder (BPD), such as non-suicidal self-injury (NSSI), substance use and aggression, in children and adolescents.

Method: Three electronic databases were searched to find empirical studies which included children and adolescents (<19 years old), reported on association between rumination and forms of behaviour associated with BPD and were written in English. Thirty studies were included for review. Data were synthesised and studies were assessed against a quality framework.

Results: There was variability in the types of rumination and dysregulated behaviours measured in children and adolescents. Significant associations were found between measures of emotion-focused or general rumination and dysregulated behaviours connected with BPD. Quality assessment indicated varying levels of quality in these studies.

Discussion: The review highlights the differential associations various subtypes of rumination may have with dysregulated behaviours, such as NSSI and aggression that relate to BPD. The role these associations may have in the context of BPD and implications for treatment is discussed. Limitations of the review and recommendations for future research are discussed.

Keywords: Adolescents, Borderline Personality Disorder, Children, Dysregulated Behaviours, Rumination

1.Introduction

The ability to regulate emotions effectively can have important implications for mental health (Gross & Munoz, 1995) and can play an integral role in the development and maintenance of youth psychopathology. Emotional regulation is a complex, multidimensional construct that encompasses emotional awareness, understanding and the acceptance of one's emotions, in combination with the ability to manage arousal levels and act adaptively regardless of emotional state (Gratz & Roemer, 2004). Attempts to regulate emotion can include cognitive strategies, which can be considered helpful or unhelpful depending on long term outcomes.

Rumination is a common cognitive strategy and therefore may have certain advantages for use, for example dwelling on particular goals may improve future performance (Ciarocco, Vohs & Baumeister, 2010). It is a cognitive strategy however that is consistently deemed unhelpful in the literature, as it has well-established associations with the exacerbation and maintenance of a variety of mental health difficulties for adults and adolescents, including depression (Nolen-Hoeksema, Stice, Wade, & Bohon, 2007), anxiety (Calmes & Roberts, 2007), eating disorders (Smith, Mason, & Lavender, 2018), substance use problems (Nolen-hoeksema & Harrell, 2002) and Borderline Personality Disorder (BPD; Baer & Sauer, 2011). BPD is a serious mental health condition that is associated with a range of dysregulated behaviours, which in some theories have been linked to rumination (Selby, Anestis, & Joiner, 2008). Although the diagnosis of BPD in anyone under the age of 18 years remains a controversial topic (Chanen & Mccutcheon, 2008), the behaviours associated with the diagnosis can present initially in childhood and adolescence and appear to be predictive of long-term deficits in functioning (Winsper et al., 2015). Subsequently, this review aims to explore the research available for this age group associating rumination and the relevant dysregulated behaviours.

1.1 The Concept of Rumination

There is no unified definition of rumination, despite a robust evidence base supporting the concept. Initial theories of rumination conceptualised it as repetitive thinking about the causes, consequences and symptoms of one's negative affect (Conway, Csank, Holm, & Blake, 2000; Nolen-hoeksema, 1991). Early findings indicated a strong overlap of this conceptualisation of rumination and measures of depression. A factor analysis of the Response Styles Questionnaire (Nolen-Hoeksema & Morrow, 1991) identified two distinct aspects of rumination, which accounted for the relationship between rumination and depression (Treynor, Gonzalez, & Nolen-hoeksema, 2003). The first subtype, reflection, relates to a more helpful rumination style and was defined as "purposeful tuning inward to engage in cognitive problem-solving to alleviate one's depressive symptoms" (Treynor et al., 2003, p. 256). Whereas the second factor, brooding, relates to a more 'harmful' subtype and is defined by the person dwelling on the negative consequences of one's mood (Miranda & Nolen-Hoeksema, 2007).

Research has expanded from focusing almost exclusively on rumination in response to sadness. Measures have been developed to assess other negative emotions, such as rumination in relation to anger (Sukhodolsky, Golub, & Cromwell, 2001) and hostility (Caprara, Mazzotti, & Prezza, 1990), as well as specific negative experiences (Nolen-Hoeksema & Jackson, 2001). Subsequent research has broadened the definition of rumination to a maladaptive form of repetitive, passive and unconstructive thinking about the person's own problems, thoughts, emotions, actions or past events (Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008).

1.2 BPD and Rumination

Initially, researchers suggested that depressive rumination may be common in people with a diagnosis of BPD. Significant associations have been found between rumination and BPD symptoms in adults, when controlling for current levels of depression (Abela, Payne, & Moussaly, 2003; Selby, Anestis, Bender, & Joiner Jr., 2009; Smith,

Grandin, Alloy, & Abramson, 2006). These studies, however, are restricted to depressive rumination, whereas people with a diagnosis of BPD are likely to experience a wide range of negative moods and experiences about which they might ruminate, including depression, anger and difficult interpersonal interactions. When measuring anger rumination, it is shown to be more consistently associated with BPD symptoms, including self-harm, even after controlling for general rumination (Peters et al., 2017). However, in the study by Peters et al., they did not control for the symptoms often associated with comorbidity in BPD, such as depression, post-traumatic stress, substance misuse and eating disorders.

In the general literature, anger rumination has been associated with heightened alcohol consumption (Ciesla, Dickson, Anderson, & Neal, 2011), aggression and hostility (Borders, Earleywine, & Jajodia, 2010). Sadness rumination on the other hand is more frequently associated with depressed mood (Peled & Moretti, 2007a). This suggests that how we conceptualise, and measure rumination is important for understanding the consequences. Furthermore, this research was carried out on adult populations and the shared and unique correlates of sadness and anger rumination in childhood and adolescence may differ from those found in adulthood.

Research has found that several different types of rumination, including anger, depressive, stress-reactive and interpersonal, showed incremental validity over general distress in predicting severity of BPD features in a student sample (Upton, Peters, Eisenlohr-Moul, & Baer, 2011), suggesting rumination is important beyond simply feeling low. This was supported by Selby et al. (2009) who found a composite rumination variable that included brooding, anger rumination and catastrophising to be significantly associated with severity of BPD symptoms. Furthermore, rumination mediated the relationship between BPD symptoms and dysregulated behaviour. Thus, there is support for the hypothesis of rumination playing an integral role in contributing to emotional intensity and behavioural dysregulation.

1.3 Borderline Personality Disorder

To understand BPD, it is helpful to refer to definitions and diagnoses suggested in current literature and policies. The two main diagnostic tools are the Diagnostic and Statistical Manual of Mental Disorders, fifth edition (DSM-5; American Psychiatric Association, 2013) and the International Classification of Diseases (ICD11; World Health Organisation, 2018). The former defines BPD as a difficulty characterised by a pervasive pattern of instability in affect, interpersonal relationships and impulsivity. According to the DSM-5, people may get a diagnosis of BPD if they have an enduring pattern of symptoms for at least two years. Symptoms for adolescents, however, need only be present for at least one year. The ICD-11 on the other hand, has reclassified all personality disorder diagnoses on a continuum-based approach: mild, moderate and severe. Unlike with the DSM-5, the ICD-11 has redefined BPD based on impairment in personality functioning and has no specified minimum age for diagnosis. Despite this recent change in the DSM-5, BPD continues to be a term used in practice. The controversies in adolescent diagnosis will be briefly discussed in the next section.

People with a diagnosis of BPD can be highly emotionally reactive; they show extreme reactions and a prolonged return to baseline affective state when compared to people without BPD (Hazlett et al., 2013). These difficulties in affect could be related to the challenges observed with interpersonal relationships and impulse control. The profound fear of abandonment tends to result in desperate efforts to avoid being alone. Close relationships however are marked by repeated arguments and breakups and highly emotional or unpredictable responses that can include aggressive and violent behaviours towards others (Newhill, Eack, & Mulvey, 2009; Sansone & Sansone, 2012; Scott, Stepp, & Pilkonis, 2014). Whilst some research indicates that both men and women report a higher number of violent offences (Hernandez-avila et al., 2000), others indicate that aggression in women with BPD are more often directed towards material damage than harm against another person (Karsten, Vogel, & Lancel, 2016).

People meeting the criteria for BPD tend to engage in two types of impulsive acts: physically self-destructive behaviours and more general forms of impulsivity (Lieb, Zanarini, Schmahl, Linehan, & Bohus, 2004). Self-destructive acts constitute any form of suicide attempts and non-suicidal self-injury (NSSI). NSSI is any deliberate destruction of one's own bodily tissue without suicidal intent and for reasons not socially sanctioned (Bentley, Nock, Sauer-Zavala, Gorman, & Barlow, 2017). General forms of impulsivity cover a wide array of behaviours, including substance use, serious under or over eating, spending sprees, verbal outbursts and reckless driving (Levy et al., 2006; Lieb et al., 2004).

1.4 BPD in Adolescence

The diagnosis of BPD in adolescence remains a controversial topic. There are concerns about labelling young people with a diagnosis that does not account for the developmental issues characteristic of adolescence (Shapiro, 1990). It is a diagnosis which is highly stigmatised among professionals (Knaak, Szeto, Fitch, Modgill, & Patten, 2015) and is also associated with high self-stigma (Rusch et al., 2006; Rüsch et al., 2007). As stigma can present obstacles to healthcare provision (Aviram, Brodsky, & Stanley, 2006) as well as impact self-esteem and self-efficacy (Corrigan & Watson, 2002; Rüsch, Angermeyer, & Corrigan, 2005), it is clear why clinicians are reluctant to assign the BPD label to adolescence.

BPD has been described, in part, to be socially constructed (Lewis & Grenyer, 2009), with extensive symptom overlap with other mental health diagnoses, particularly bipolar disorder (Paris & Black, 2015). Proctor (2010) has suggested the BPD diagnosis to be not only shaped by cultural and moral expectations, but to be a gendered construct that is discriminatory towards women. Indeed, healthcare professionals associate the presentation of similar symptoms in women with BPD, whereas men seem more likely to be diagnosed with anti-social personality disorder (Chun et al., 2017; Veysey, 2014).

It is a diagnosis however that is associated with poor quality of life and has severe impacts on interpersonal and social functioning (Barrachina et al., 2011). These difficulties

can be apparent from an early age. Relational aggression, intense outbursts of anger and a hostile and distrustful view of the world are some symptom identifiers for BPD recognised in adolescence (Fossati, 2014). Features such as identity disturbance, affective instability and inappropriate intense anger in adolescents are almost identical to those identified in the adult BPD population (Becker, Grilo, Edell, & Mcglashan, 2002). Most challenging are the behaviours associated with impulsivity in BPD, such as NSSI and aggression, which can be apparent from childhood. Whilst it is unclear whether these behaviours are particularly tied to BPD, they are apparent in this age group and associated with young people's psychosocial functioning (Hilt, Cha, & Nolen-Hoeksema, 2008; Nansel et al., 2001).

1.5 Development of Rumination in Childhood and Adolescence

Although there is extensive research supporting the link between rumination and psychopathology, there is surprisingly little about the development of rumination from childhood through to adulthood. Adolescence is an important period for development of emotion regulation skills, such as rumination, because adolescents experience increasing normative stressors, such as conflicts with parents, siblings and peers (Anda et al., 2000; Seiffge-Krenke, 2000).

Emotion regulation skills in general can become increasingly differentiated across development. Adolescents use adaptive and maladaptive cognitive emotion regulation strategies less frequently than adults (Garnefski, Legerstee, Kraaij, van den Kommer, & Teerds, 2002). For example, cognitive reappraisal has shown a strong linear increase with age from late childhood to young adulthood (Mcrae et al., 2012). Cognitive reappraisal involves interpreting events in alternative ways to change our emotional responses (Gross & Thompson, 2007) and is generally associated with greater wellbeing and fewer depressive symptoms (Gross & John, 2003). Similarly, some research has found rumination to increase and exhibit greater stability from late childhood through to adolescence (Hampel & Petermann, 2005). These changes in emotion regulation skills coincide with significant neurodevelopmental change, as the prefrontal cortex undergoes considerable remodelling

during adolescence, particularly in regions known to be associated with emotion regulation (Cohen et al., 2005). Other variables such as early childhood parenting and inhibitory control, as well as early temperamental anger and inhibitory control, have been found to predict the development of rumination in middle childhood (Schweizer, Olino, Dyson, Laptook, & Klein, 2018).

Whilst the evidence provides some insight into the key differences across age groups, the cross-sectional nature of the designs hampers any conclusions that can be made about the causes, consequences and correlates of rumination. The presence of rumination in children and adolescents, however, indicates high risk for onset of psychological difficulties at early stages of development. However, understanding how rumination plays a part in the development of psychopathology remains yet to be answered.

1.6 The Aim of this Review

The foregoing discussion suggests that the study of rumination in childhood and adolescence represents a potentially important contribution to understanding the development and exacerbation of dysregulated behaviours, which includes externalising behaviours that are often associated with BPD. A systematic review and synthesis of the research is required to identify extant research and future research priorities. Therefore, this review will address this by examining the types of rumination and associated measures of dysregulated behaviours observed in children and adolescents, as well as reporting on the magnitude of these associations. The objectives of this review are threefold; firstly, we aimed to identify the different types of rumination measured in children and adolescents in the current literature. Secondly, the review aimed to explore any associations reported in the child and adolescent literature between the various types of rumination and behaviours that are associated with BPD. Finally, we aimed to report on the quality of the literature using a standardised quality assessment tool. The results of this review will help to inform healthcare professionals about the role that different types of rumination may play in various behavioural presentations and any commonalities between these. This may have clinical

implications for a more targeted tailoring of assessment, formulation and treatment models that incorporate the underlying role of the rumination in the person's presentation. Furthermore, expanding our knowledge on the different types of rumination may allow more informed approaches to prevention and early intervention in youth to prevent chronicity and stigmatising labels in later life.

2.Method

2.1 Search Strategy

Firstly, a scoping exercise was conducted using 'Google Scholar' and the databases listed below to assess the feasibility of undertaking a review on this topic. The Cochrane database was also searched to ensure that there were no current systematic reviews being conducted with the same research question. To retrieve papers for this review, the following databases were searched: PsychInfo, Medline and Web of Science.

Search terms were established using MeSH and noting key words from relevant articles. There are many definitions of rumination and it is often unclear how this phenomenon is distinct from other similar constructs such as worry; although some models compare rumination to a type of worry, others have highlighted its distinctiveness (Smith & Alloy, 2009). For the purpose of this review, we will refer to rumination as the repetitive and passive focus on symptoms of distress and on possible causes and consequences of these symptoms (Nolen-Hoeksema et al., 2008). The final search terms selected for dysregulated behaviours in BPD were based on behavioural categories identified in the DSM-5 (American Psychiatric Association, 2013) and BPD literature (Carpenter & Trull, 2013a; Levy et al., 2006; Lieb et al., 2004).

Although we were interested in the behaviours associated with BPD, we preferred not to narrow the approach to the specific construct of BPD, which may not incorporate behaviours that are often highly comorbid i.e. eating disorders. Furthermore, as a controversial topic in this age group it was thought that BPD would not be measured in a consistent way or identified by name in the studies. Therefore, the term 'BPD' or any synonyms were not included in the search terms.

Combination of the key words used to search the databases are detailed in Table 1. Within each column the Boolean operator "OR" was applied and between the columns (1, 2

and 3) the Boolean operator “AND”. A total of 1129 articles were returned. After removal of duplicates, a total of 1114 articles remained (see Figure 1).

Table 1 *Keywords used to search the target databases*

1.Population	**2.Rumination synonyms**	**3.Dysregulated behaviours**
Child*	Rumin*	“dysregulated behavio*”
Adolescen*	“repetitive thinking”	“externali?ing behavio*”
Infan*	“Repetitive thought*”	“self-destructive”
Teen*	Brooding	“reckless behavio*”
Youth*	“post event process”	Impulsiv*
Young*		Suicid*
“Emerging adult”		NSSI
“Secondary school*”		“non-suicid*”
“High school*”		“self-harm”
“Primary school*”		“self-injur*”
“Elementary school”		“substance misuse”
“Middle school*”		“substance abuse”
		Alcohol
		Drug*
		Binge
		“eating disorder”
		Aggress*
		Outburst
		“Risky sex*”
		“Harmful behavio*”

The abstracts of the remaining articles were read to ascertain suitability against the inclusion and exclusion criteria (Table 2).

Table 2 *Inclusion and exclusion criteria used in the selection of studies*

Inclusion criteria	**Exclusion criteria**
Sample only included people of 19 years and under	Non-research studies e.g. reviews, opinion papers, conference abstracts, books and protocols.
The study used a standardised self-report outcome measure of rumination	Case studies
The study used a standardised self- or other-reported outcome measure of dysregulated behaviour (that is associated with BPD)	Dissertations
The study explicitly reports on the association between rumination and the dysregulated behaviour.	Qualitative studies
Must be written in the English language or have an English translation version available	Duplicate sample from another study.
	If only post-intervention outcome measures available (pre-intervention or baseline measurements will be included if in line with inclusion criteria).

2.2 Study Retrieval and Selection

Prior to commencement of this review, the protocol was published on PROSPERO (CRD42018111486) online. An extensive search of the databases without data restrictions was carried out on 7th November 2018 using the search terms listed in Table 1. All searches were carried out by JM and 10% were independently reviewed by JS. The screening and selection processes are summarised in the PRISMA diagram (Figure 1).

The title and abstract of each of the papers were examined based on the criteria listed in Table 2. When the suitability of the study could not be deciphered from reading the abstract, the whole article was reviewed. Following this process, 28 studies were found to be eligible for inclusion in this review. The reference lists of the selected studies were explored

and a further study (Garnefski, Kraaij, & van Etten, 2005) was considered for inclusion. One of those selected (Smith, Stephens, Repper, & Kistner, 2016) contained two separate studies, and these have been considered separately in the analysis.

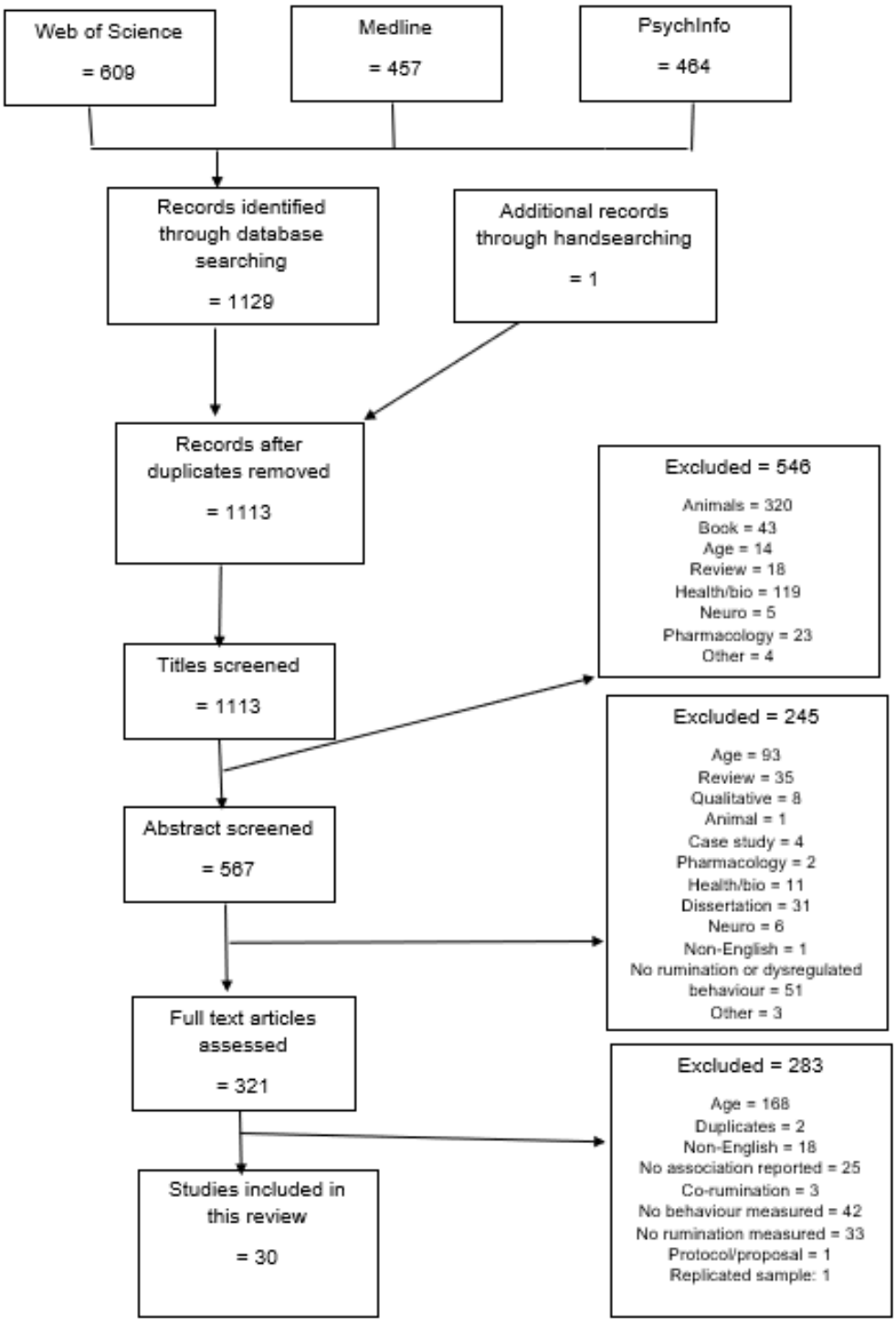

Figure 1 *PRISMA diagram of study identification and selection*

2.3 Data Extraction

The selected studies were either cross-sectional or longitudinal in design. A data extraction form was developed based on the review question as an organising framework. Information on the sample, measure of rumination and dysregulated behaviour and association between these variables was the focus of data extraction. Key descriptive information about each study was also recorded. Data extraction was completed by JM.

2.4 Methodological Quality

None of the final 30 studies were excluded based on quality. The Downs and Black (1998) checklist has been recommended as a comprehensive quality assessment tool (Deeks et al., 2003) for observational and randomised control trials. The original checklist consists of 27 items with a maximum total score of 32 points, in addition to the following subscales: study quality, external validity, internal validity, selection bias and power. As this tool was developed for randomised and non-randomised control trials, the tool was modified for the objectives of this review. Subsequently, items 4, 5, 8, 14, 15, 17, 19 and 21-24 were excluded as they relate only to intervention-based studies. Discussions with the supervisory team led to item 13 being excluded from the tool because the studies mainly included community samples and therefore this item was deemed not to provide any additional information for external validity. The remaining 15 items provide an overall score based on the five categories: study quality (*n*= 7), external validity (*n*= 2), internal validity (*n*= 3), selection bias (*n*= 2) and power (*n*= 1). Item 9 was adapted to two options to apply to either cross-sectional (“Is the response rate clearly described?) or longitudinal designs (“Have the characteristics of people lost to follow-up been described?”). As item 26 was only relevant to longitudinal designs, this was not applied for cross-sectional studies. Accordingly, to take account of the varying total items between types of design, we chose to present the quality assessment total as a percentage score. A description of the quality assessment tool is available in Appendix 3.

The methodological quality of the eligible articles was assessed by JM and independently verified by LC.

3.Results

The review aimed to assess the associations between different types of rumination and dysregulated behaviours in children and adolescents. The results section will outline the measures used for these variables and provide an overview of the methodological quality of the studies to assess the results' reliability, validity and context in which the research was undertaken. Finally, a qualitative synthesis of the data extracted (Tables 5 and 6) will be provided.

3.1 Study Characteristics

The final 30 studies employed either a cross-sectional (*n* = 18) or longitudinal design (*n*= 12), and details are listed in Table 3. Most of the studies (*n*= 24) have been published within the last ten years (2008 – 2018), reflecting the limited research into rumination and dysregulated behaviours in children and adolescents prior to this date. The majority of the included studies were conducted in the United States (*n*= 12), with the remaining studies being conducted in Canada (*n*= 4), Australia (*n*= 4), Italy (*n*= 3), Portugal (*n*= 2), Netherlands (*n*= 1), Spain (*n*= 1), United Kingdom (*n*= 1), Belgium (*n*= 1) and Sweden (*n*= 1). Overall, the selected studies recruited from an adolescent population (11-19 years). However, three studies recruited from children as young as 7 years old (Goodman & Southam-Gerow, 2010; Harmon, Stephens, Repper, Driscoll, & Kistner, 2017; Smith et al., 2016), although specific age ranges were not provided and estimation is based upon school grade. Most of the studies recruited the samples from schools (*n*= 24), whereas the remaining studies recruited from psychiatric services (*n*= 1), health clinics (*n*= 1), offending programmes (*n*= 2) and community advertising (*n*=1). The sample size of individual studies ranged from 25 – 2637 children and adolescents.

Table 3 *Characteristics of studies included in the systematic review*

Study	Design	Behavioural subtype	Country	Gender	Age	Sample size	Context
Caprara et al. (2017)	Cross-sectional	Aggression	Italy	74.3% females; 25.7% males	11-18 years (M = 13.83)	109	Psychiatric services
Del Bove, Caprara, Pastorelli, & Paciello (2008)	Cross-sectional	Aggression	Italy	311 boys; 256 girls	11-18 years (M = 13.6)	567	Community
Francisco, Loios, & Pedro (2016)	Cross-sectional	Aggression	Portugal	57.8% female	12-18 years (M = 15.11)	341	Community
Garnefski et al. (2005)	Cross-sectional	Aggression	Netherlands	48.9% females; 51.1% males	12-18 years (M = 15)	271	Community
Goodman & Southam-Gerow (2010)	Cross-sectional	Aggression	USA	69% females, 31% males	7-12 years (M = 9.5)	79	Community
Harmon et al. (2017b)	Cross-sectional	Aggression	USA	50.4% female; 49.6% male	Grades 2 – 7 (M = 10.61 years)	254	Community
Mathieson, Klimes-Dougan, & Crick (2014)	Cross-sectional	Aggression	Canada	51% female; 49% males	10.9-15.2 years (M=13.4)	499	Community
Patel, Day, Jones, & Mazefsky (2017)	Cross-sectional	Aggression	USA	0% female; 100% male	12-19 years (M=15)	49	Community
Peled & Moretti (2007b)	Cross-sectional	Aggression	Canada	65 girls; 56 males	12-18 years (M=15.2)	121	Forensic
Rey Peña & Pacheco (2012)	Cross-sectional	Aggression	Spain	53% females; 47% males	11-18 years (M=13.99)	248	Community
Smith et al. (2016; study 1)	Cross-sectional	Aggression	USA	50.4% female; 49.6% male	M = 10.62 years	254	Community
Vasquez, Osman, & Wood (2012)	Cross-sectional	Aggression	UK	40% female; 60% male	13-16 years	310	Community
Tanner, Hasking, & Martin (2015)	Cross-sectional	NSSI/Aggression	Australia	68% female; 32% male	12-18 years (M=13.94)	2356	Community
Burke et al. (2015)	Cross-sectional	NSSI	USA	72% female; 28% male	14-19 years (M=18.69)	177	Community
Tanner, Hasking, & Martin (2014)	Cross-sectional	NSSI	Australia	53% females; 47% males	12-18 years (M=13.93)	1789	Community
Voon, Hasking, & Martin (2014c)	Cross-sectional	NSSI	Australia	68% female; 32% male	12-18 years (M=13.9)	2507	Community
Xavier, Cunha, & Pinto-Gouveia (2018)	Cross-sectional	NSSI	Portugal	52% female; 48% male	12-18 years (M=14.55)	776	Community

Study	Design	Behavioural subtype	Country	Gender	Age	Sample size	Context
Willem, Bijttebier, Claes, & Raes (2011)	Cross-sectional	Substance use	Belgium	50% female; 50% male	14.1-19.8 years (M=16.7)	189	Community
Caprara, Paciello, Gerbino, & Cugini (2007)	Longitudinal	Aggression	Italy	50% female; 50% male	M = 12.5 years (Time 1)	500	Community
McLaughlin, Hatzenbuehler, Mennin, & Nolen-Hoeksema (2011)	Longitudinal	Aggression	USA	49% female; 51% male	11-14 years (M=12.2)	1065	Community
McLaughlin, Aldao, Wisco, & Hilt (2014)	Longitudinal	Aggression	USA	49% female; 51% male	11-14 years (M=12.2)	1065	Community
Smith et al. (2016; study 2)	Longitudinal	Aggression	USA	0% female; 100% male	14-18 years (M16.74)	119	Forensic
Adrian, McCarty, King, McCauley, & Stoep (2014)	Longitudinal	Aggression	USA	48% female; 52% male	11-13.6 years (M=12)	455	Community
Hilt, Armstrong, & Essex (2017)	Longitudinal	Substance use	USA	52% females; 48% males	M = 15.26 (Time 1)	388	Community
Skitch & Abela (2008)	Longitudinal	Substance use	Canada	54% female; 46% male	12-18 years (M=15.17)	161	Community
Barrocas, Giletta, Hankin, Prinstein, & Abela (2015)	Longitudinal	NSSI	China	51% female; 49% male	15-17 years (M=16.02)	617	Community
Voon et al. (2014a)	Longitudinal	NSSI	Australia	68% female; 32% male	M = 13.9 years (Time 1)	2637	Community
Bjarehed & Lundh (2008)	Longitudinal	NSSI/Substance use	Sweden	51% female; 49% male	M = 14.1 years	175	Community
Holm-Denoma & Hankin (2010)	Longitudinal	Eating difficulties	USA	100% female; 0% male	11-17 years (M=14.5)	191	Community
Auerbach, Kertz, & Gardiner (2012)	Longitudinal	Risky behaviour (general)	Canada	55% female; 45% male	12-18 years (M=15.14)	151	Community

3.2 Methodological Quality

The 30 studies were assessed using the five quality subscales of the modified Downs and Black (1998) quality assessment checklist; study quality, external validity, internal validity, selection bias and power, along with an overall quality rating. A summary of the subcategory and overall scores is provided in Table 4. For the overall quality index, a maximum score of 14 was possible for cross-sectional designs and 15 for longitudinal designs. An overall percentage was calculated for each study. For the 30 studies assessed the average overall quality index percentage was 62.17% (SD = 13.07), with scores ranging from 35.71% to 85.71%. The main methodological limitations included reporting of power, external validity and reporting of exact probability values.

3.2.1 Reporting subscale.

With a maximum score of 7 on the reporting subscale, the average score was 4.87 (SD = 0.97). None of the selected studies received a score of 7 for this category; scores ranged from 3 (42.86%) to 6 (85.71%). The item most frequently receiving zero points (67% of the reviewed studies) was item 7; “Have actual probability values been reported?”. Only reporting general p-values (i.e. $p<.05$) can mean useful information is lost and suggests an assumption that data is valuable only if it passes a certain threshold for the p-value.

3.2.2 External validity subscale.

Only 50% of the studies used methods to enrol study participants that ensured representativeness of the population (n = 15), and even fewer studies reported on or ensured representativeness of the recruited sample (n = 6, 20%). With a maximum score of 2 for this subscale, the average score was 0.7 (SD = 0.75). A total of 47% (n = 14) of the studies did not provide sufficient information to meet the quality indicator for the external validity category and ultimately scored a zero.

3.2.3 Internal validity subscale.

There was a maximum score of 3 for the internal validity-bias subscale. The mean score for studies in this review was 2.33 (SD = 0.61). A total of 12 (40%) studies received a maximum score of 3 for this category. The most frequent items not meeting the quality indicator in this subscale were data dredging (*n* = 9; 30%) and appropriate use of statistical outcomes (*n* = 8; 27%).

3.2.4 Selection bias subscale.

For cross-sectional studies (*n*=18), there was a maximum score of 1 for the selection bias subscale. The mean score for these studies was 0.72 (SD = 0.46), as only 5 studies (28%) scored a 1 for this category. Longitudinal studies on the other hand, have a maximum score of 2 for this subscale, with a mean of 1.50 (SD = 0.80). For this group, only 2 studies (17%) scored a zero overall. Generally, studies accounted for confounding factors in their analyses and often controlled for significant variables, such as age and gender.

3.2.5 Power subscale.

Power calculations were consistently not reported across the selected studies, except for the most recently published study (Xavier et al., 2018). Although the majority of studies did not provide power calculations, five studies reflected on the potential of their results being underpowered in the discussion sections of their respective publications (Caprara et al., 2017; Goodman & Southam-Gerow, 2010; Hilt et al., 2017; Patel et al., 2017; Voon et al., 2014a).

Table 4 *Quality ratings using a modified version of the Downs and Black (1998) checklist for measuring quality*

Study	Study quality (%)	External validity (%)	Internal validity (%)	Selection bias (%)	Power (%)	Overall %
Caprara et al. (2017)	57.14	50	66.67	100	0	57.14
Del Bove, Caprara, Pastorelli, & Paciello (2008)	57.14	0	100.00	100	0	57.14
Francisco, Loios, & Pedro (2016)	85.71	0	66.67	100	0	64.29
Garnefski et al. (2005)	71.43	50	100.00	100	0	71.43
Goodman & Southam-Gerow (2010)	85.71	50	100.00	100	0	78.57
Harmon et al. (2017b)	85.71	100	100.00	100	0	85.71
Mathieson, Klimes-Dougan, & Crick (2014)	85.71	50	66.67	100	0	71.43
Patel, Day, Jones, & Mazefsky (2017)	85.71	0	66.67	0	0	57.14
Peled & Moretti (2007b)	71.43	50	33.33	100	0	57.14
Rey Peña & Pacheco (2012)	57.14	0	100.00	100	0	57.14
Smith et al. (2016; study 1)	71.43	0	66.67	100	0	57.14
Vasquez, Osman, & Wood (2012)	42.86	0	0	100	0	28.57
Tanner, Hasking, & Martin (2015)	85.71	50	66.67	0	0	64.29
Burke et al. (2015)	42.86	0	66.67	0	0	35.71
Tanner, Hasking, & Martin (2014)	71.43	50	66.67	0	0	57.14
Voon, Hasking, & Martin (2014c)	42.86	0	66.67	100	0	42.86
Xavier, Cunha, & Pinto-Gouveia (2018)	85.71	0	66.67	0	100	64.29
Willem, Bijttebier, Claes, & Raes (2011)	85.71	0	100.00	100	0	71.43
Caprara, Paciello, Gerbino, & Cugini (2007)	57.14	0	66.67	100	0	53.33
McLaughlin, Hatzenbuehler, Mennin, & Nolen-Hoeksema (2011)	71.43	50	100.00	0	0	60.00
McLaughlin, Aldao, Wisco, & Hilt (2014)	71.43	100	100.00	50	0	73.33
Smith et al. (2016; study 2)	71.43	50	100.00	100	0	73.33
Adrian, McCarty, King, McCauley, & Stoep (2014)	71.43	100	100.00	100	0	80.00
Hilt, Armstrong, & Essex (2017)	85.71	0	66.67	100	0	66.67
Skitch & Abela (2008)	71.43	100	100.00	100	0	80.00
Barrocas, Giletta, Hankin, Prinstein, & Abela (2015)	71.43	50	100.00	100	0	73.33
Voon et al. (2014a)	71.43	50	66.67	100	0	66.67
Bjarehed & Lundh (2008)	57.14	0	66.67	50	0	46.67
Holm-Denoma & Hankin (2010)	57.14	100	100.00	100	0	73.33
Auerbach, Kertz, & Gardiner (2012)	57.14	0	66.67	0	0	40.00

3.3 Rumination Outcome Measures

The studies included in this review used a variety of outcome measures to assess rumination in children and adolescents. Details of measures used are provided in Tables 5 and 6. Most of the studies included in this review employed instruments that measured rumination to sadness (*n* = 11). The most common of these was the complete Ruminative Response scale (22-items), from the Response Style Questionnaire (RSQ; Nolen-Hoeksema & Morrow, 1991), or a condensed version based on the brooding (5-items) and reflective (5-items) components identified by Treynor et al. (2003). One study (Barrocas et al., 2015) used the complete scale, which has been criticised due to items reflecting depression rather than rumination (Conway et al., 2000). Five studies utilised the brooding subscales (Adrian et al., 2014; Burke et al., 2015; Hilt et al., 2017; Willem et al., 2011; Xavier et al., 2018), which are not contaminated by items overlapping depression. A more recent version of the scale (Armey et al., 2009) however, has removed a further two-items from this subscale that are shown to confound with symptoms of depression.

Similarly, the Children's Response Styles Questionnaire (CRSQ; Abela, Brozina, & Haigh, 2002) is modelled on the RSQ and determines the extent to which children respond to sad feelings with rumination, distraction or problem-solving. Whilst McLaughlin et al. (2014, 2011) used the full 25-item version of the measure, Holm-Denoma and Hankin (2010) used the 13-item rumination subscale. However, Abela et al. (2002) did not provide any information regarding the convergent validity of this measure nor is it clear that the measure represents the three factors that it purports to measure because confirmatory factor analyses were not provided. The Children's Response Style scale (Ziegert & Kistner, 2002) used by Harmon et al. (2017) was also a derivative of the RSQ. This measure consists of 10-items forming the rumination subscale and was designed to minimise the amount of overlap between rumination and depressive symptoms.

Peled and Moretti (2007b) used a combined measure for sadness and anger, which was created for the study. The sadness and anger inventory was designed using items from

the Rumination on Sadness scale (5-items; Conway et al., 2000), the Anger rumination scale (4-items; (Sukhodolsky et al., 2001), the Dissipation-Rumination Scale (1-item; Caprara, 1986) and a new intensification item was created. The Rumination on sadness scale (Conway et al., 2000) was created following overlap with depressive symptoms in the RSQ. However, a psychometric evaluation of the RSS suggests that the goal of reduced overlap was only partially successful (Roelofs, Muris, Huibers, Peeters, & Arntz, 2006). Therefore, results associating sadness rumination with any behaviours that are typical of depression ought to be interpreted with care.

There was a total of nine studies measuring anger rumination, using three different measures. The Hostile-Rumination scale or the Dissipation Rumination scale (Caprara, 1986) was used in full (10-items; Caprara et al., 2007; Del Bove et al., 2008) or as a condensed version (6-items; Caprara et al., 2017) by several studies. It is an adequately reliable measure of rumination but does contain at least one item that may overlap with angry affect ("when I am outraged, the more I think about it, the angrier I feel"). This may artificially inflate any associations with aggression via anger if affect is not controlled for.

The most common measure of anger rumination utilised in these studies was the Anger Rumination Scale (19-items; Sukhodolsky et al., 2001), which focuses on a general pattern of ruminative cognition rather than rumination on a specific anger-provoking event. Patel et al (2017) used the original version designed for adults whilst Harmon et al. (2017), Vasquez et al. (2012) and Smith et al. (2016; study 1 and study 2) used versions adapted for children. Unfortunately, these measure of anger rumination confound process with outcome and thus create a higher shared variance with aggression than general rumination would (Borders et al., 2010).

A total of six studies used measures that assessed rumination to negative feelings or events in general. The rumination subscale (3-items) of the Response to Stress Scale (RSS: Connor-Smith et al., 2005) was used in two studies (Auerbach et al., 2012; Skitch & Abela, 2008). It assessed a person's tendency to respond to negative life events by focusing on the

uncontrollability of subsequent thoughts and feelings. The authors reported that this scale has been found to be strongly related to the brooding component of rumination, rather than reflection. Therefore, it is unclear how much this scale measured sadness rumination as opposed to stress.

The Cognitive Emotion Regulation Questionnaire (CERQ; Garnefski, Kraaij, & Spinhoven, 2002) was used in full (Garnefski et al., 2005) or the shortened version (Rey Peña & Pacheco, 2012). This scale includes items that address nine types of cognitive strategies used in response to stressful events, of which 4-items (full version) or 2-items (shortened version) measure rumination. The CERQ has performed well in clinical and nonclinical samples (Garnefski et al., 2002) and across the age span (Garnefski & Kraaij, 2006) and may be a measure that is free of affect-laden content.

Two studies used measures of rumination specifically in relation to victimisation experiences. Goodman and Southam-Gerow (2010) used the Survey for Coping with Rejection Experiences (Sandstrom, 2004), which assess coping strategy in response to relational aggression (being teased by peers or being excluded from a group activity). A factor analysis indicated rumination to be one such coping strategy. Mathieson et al. (2014) used a rumination scale adopted from (Nolen-hoeksema & Jackson, 2001) to assess rumination in response to someone being mean. Neither of these measures specified the emotional response to the event, which could differ amongst participants and thus affect associations with subsequent behaviours if emotion plays a role in the association.

The psychometric properties for the Coping and resilience Questionnaire (CR; Crespo & Francisco, 2011) employed by Francisco et al. (2016) and the Emotion Regulation Questionnaire for Adolescents (ERQA) used by Bjarehed and Lundh (2008) could not be determined due to language barriers or the unavailability of relevant studies. Therefore, any conclusions based on the use of these measures ought to be taken with caution.

The most recent measure of rumination used in four studies in this review (Tanner et al., 2014, 2015, Voon et al., 2014c, 2014a) was the Ruminative Thought Style Questionnaire (Brinker & Dozois, 2009). This 20-item measure describes positive, negative and neutral facets of global rumination, and is subsequently reported by its developers to be less biased by valence, content or temporal orientation than traditional measures of rumination. The items were summed to produce four separate subscales of problem-focused, counterfactual, repetitive and anticipatory rumination. The RTSQ is reported to have good convergent validity with the RSQ, Global Rumination Scale and Beck Depression Inventory (Brinker & Dozois, 2009). Some items however, contain idiomatic phrases (e.g. “when I have a problem, it will gnaw on my mind for a long time”) or are long (e.g. “when trying to solve a complicated problem, I find that I just keep coming back to the beginning without ever finding a solution”), which may not be developmentally appropriate and easily understood by young people.

3.4 Measures of Dysregulated Behaviours

The types of dysregulated behaviours included in the studies varied between aggression/violence (*n*= 18), NSSI (*n*= 8), substance use (*n*= 5), eating disorders (*n*=2) or general risky behaviours (*n*= 1). There were approximately 14 different measures of aggression, which included self-report (*n* = 10) and other-report (*n* = 4) measures. There were few overlaps in the types of measures for aggression used across the studies, and those studies that used a similar measure focused on a different subscale (e.g. delinquent behaviour or aggressive behaviour subscale of the Youth Self-Report; Achenbach, 1991). Measures of aggression assessed firesetting behaviours, physical, verbal, displaced and relational aggression.

A total of eight studies assessed NSSI behaviour in adolescents. A range of five different outcome measures were used across all these studies that all relied on self-report. Similarly, studies measuring substance use (*n* = 5) used only self-report measure. A total of

six different outcome measures were used to measure frequency of alcohol use, drug use or negative consequences of use. Finally, only one study (Holm-Denoma and Hankin, 2010) was included in this review that measured eating behaviours in adolescents, and also used self-report. One study (Auerbach et al., 2012) used a self-report measure that incorporated all of the risky behaviours listed above (Risky Behaviour Questionnaire – Adolescents; RBQ-A; Auerbach & Gardiner, 2012).

3.5 Association between Rumination and Dysregulated Behaviour

3.5.1 Association with aggression.

Firesetting behaviours were measured in two cross-sectional studies (Del Bove et al., 2008; Tanner et al., 2015) and reported different results on the association with rumination. Del Bove et al. (2008) found significant differences in hostile rumination between the aggression group and controls, the firesetting group and controls and the aggression/firesetting group and controls. Although the aggression/firesetting group reported the highest level of hostile rumination (M=4.53, SD = 1.24), followed by the firesetting group (M = 4.36, SD = 1.20) and the aggression group (M = 4.15, SD = 1.29), it is difficult to establish whether rumination is higher in all adolescents with externalising behaviours because these groups were found not to statistically differ. We are unable to determine if participants are higher in anger in general because Del Bove et al. (2008) did not control for anger in their analysis. Tanner et al. (2015) on the other hand, used a measure that had less of an overlap with negative valence. They found four subtypes of rumination (repetitive thoughts, anticipatory thoughts, problem-focused thoughts and counterfactual thinking) to not be significantly related to firesetting behaviour in youth. Although both studies were reliant on self-report data of firesetting using a single item, they each differed in the measure of firesetting and assessed a different type of rumination. Firesetting behaviour in Del Bove et al. (2008) was assessed based on any engagement in firesetting whereas the firesetting

group in Tanner et al.'s (2015) study was identified as youths who had set fires on more than two occasions. One could argue that the Tanner et al. study excludes youths who set fires once out of curiosity. Although neither explicitly distinguished between the intention of the behaviour (e.g. curiosity versus intent to cause harm), it may be that higher rumination is not typical of more pathological types of firesetting behaviour.

A total of six studies reported significant cross-sectional zero-order positive correlations between anger rumination and aggression (Caprara et al., 2007; Harmon, Stephens, Repper, Driscoll, & Kistner, 2017a; Patel et al., 2017; Peled & Moretti, 2007b; Smith et al., 2016; Vasquez et al., 2012), for both boys and girls (Caprara et al., 2007). The strength of these associations ranged from *r*=.23 to *r*=.65. The study by Vasquez et al. (2012) produced the strongest correlation between rumination and aggression (*r*=.65), however they scored the lowest for methodological quality. Three of these studies rely on self-reported data for both rumination and their aggressive behaviour, so the magnitude of the effects may have been artificially inflated due to shared-method variance. The studies utilising other-report measures for aggressive behaviour (Harmon et al., 2017; Smith et al., 2016; study 1) reported weaker associations compared with studies using self-report measures (*r*=.25 to *r*=.28). These significant findings, however, suggest that a positive relationship is detectable between anger rumination and aggression.

Results could depend on the type of research design chosen or they could differ based on the type of sample chosen to be studied. Clinical samples are different from community samples in levels of symptoms, for example. Associations between rumination and aggression were not significant, in a study using parental reports (Caprara et al., 2017) and in a longitudinal staff report study (Smith et al., 2016; study 2). Caprara et al. (2017) recruited from a clinical population, as opposed to community samples, which were reviewed above. This suggests that other factors may be important to aggression in a clinical population. Although Caprara et al. (2017) did not report significant results, the analysis may have been underpowered since the effect size was small (*r*=.16). Smith et al. (2016; study 2)

used rule violations in a juvenile maximum-security setting as an observational measure of aggression. This gets away from the problems inherent in self-report. Rumination was significantly associated with aggression during the first month of youth offenders' stay, but not when considering subsequent months. Yet rule violations as an objective measure are not without their problems; juveniles' misdemeanours could be selectively written up in a formal logbook, particularly after a youth has been in the facility for a while and they come to learn to hide their aggression or are able to argue their way out of a write-up. Thus, some aggression may be missed and may lead to nonsignificant findings over time.

Most studies considered the role of confounding variables on the association between rumination and aggression. When controlling for a range of variables such as age, gender, family income, gang affiliation, sadness rumination, social responsiveness, as well as anger and depression, anger rumination remained a significant predictor of aggression (Harmon et al., 2017a; Patel et al., 2017; Peled & Moretti, 2007b; Smith et al., 2016; Vasquez et al., 2012). As results are largely unchanged, this indicates findings are robust in controlling for these variables.

Increasing research in this field has found rumination in response to a range of negative affect and events. These other types of rumination, which included rumination to sadness, victimisation and negative feelings in general, were mixed in outcome. Some studies found a significantly positive, but small zero-order concurrent correlations between self-reported rumination and aggression (Francisco et al., 2016; Goodman & Southam-Gerow, 2010; McLaughlin et al., 2014, 2011), whilst others found no significant correlation (Garnefski et al., 2005). Rey Pena & Pacheco (2012) found that more rumination to negative experiences was associated with less physical and verbal aggression for boys ($\beta = -.31$), but not for girls. When controlling for family functioning, there was no direct effect of general rumination on aggression (Francisco et al., 2016). It is unclear whether this change in significance level was because of statistical power or whether the family functioning variable is important to consider.

Two studies in this review (Harmon et al., 2017b; Peled & Moretti, 2007b) reported on the unique patterns of association for two distinct types of rumination. Peled & Moretti (2007b) found a significant negative correlation between sadness rumination and aggression whereas Harmon et al. (2017b) reported a weak association that was not significant. Harmon et al.'s study assessed peer-report of aggressive behaviours amongst community pre-adolescent children whereas Peled and Moretti's study assessed older adolescents' self-report of aggressive behaviour in a clinical setting. Therefore, the stronger association may be due to the higher frequency of aggressive behaviours that may be present in a clinical population allowing for more variance to be explained by rumination. Both studies notably reported on an interaction of sadness and anger rumination on aggression, which suggested a potential dampening effect of sadness rumination on aggression. This finding may have implications for outcomes in other studies where the type of rumination (e.g. sadness, anger) has not been clearly differentiated.

Similar to Harmon et al. (2017a), Mathieson et al. (2014) used other-report measures and found a weak and non-significant relationship between rumination to victimisation experiences and aggression (r=.04). They did however find that rumination may mediate the association between relational aggression and depressive symptoms. It may be that relationally aggressive young people ruminate about these aggressive experiences, which may lead to low mood. The direction of these associations, however, cannot be established from the current cross-sectional data.

Three longitudinal designs supported significant, but small predictive positive correlations (r=.13 – r=.26) for baseline rumination (anger and sadness types) and later aggression (Caprara et al., 2007; McLaughlin et al., 2014, 2011). Conversely, there were significant predictive positive correlations (r=.17 – r=.28) for aggression at baseline and later rumination (sadness types; McLaughlin et al., 2014, 2011). When controlling for baseline anxiety, rumination and aggression, results are largely unchanged in both directions (McLaughlin et al., 2014). Thus, there appears to be reciprocal effects between these

variables, where rumination leads to positive increases in aggression, and aggression leads to positive increases in rumination.

Anger rumination is shown to be more consistently associated with aggression than rumination to sadness or other negative experiences. Sadness rumination, however, may play a dampening role in aggression and the interaction between anger and sadness rumination may be important in understanding aggression in children and adolescents.

3.5.2 Association with NSSI.

A total of 7 studies explored concurrent zero-order correlations between rumination and NSSI (Bjarehed & Lundh, 2008; Burke et al., 2015; Tanner et al., 2014, 2015, Voon et al., 2014c, 2014a; Xavier et al., 2018). Whilst most of the studies found a significant and positive association for rumination (brooding or general types (Bjarehed & Lundh, 2008; Burke et al., 2015; Tanner et al., 2014; Voon et al., 2014c; Xavier et al., 2018)), some studies separated rumination into four subtypes (problem focused, counterfactual, anticipatory and repetitive thinking), which created variability in the results. In the studies measuring sadness or brooding rumination there may be items overlapping with depression, which is a construct previously associated with NSSI (Hawton, Rodham, Evans, & Weatherall, 2002). This may have conflated any associations reported in these studies. Tanner et al. (2015) found only problem-focused thinking (OR=1.04) and counterfactual thinking (OR=1.05) to be significant predictors of NSSI perpetration. Voon et al. (2014a) on the other hand found only problem-focused thinking to have significant concurrent association with NSSI (r=.22). Notably, Voon et al. (2014c) reported a small but significant association for anticipatory thinking (r=.06). These results suggest problem-focused rumination and NSSI are associated.

The outcome of any association between rumination and NSSI was altered however, when other variables were taken into consideration. Bjarehed & Lundh (2008) found that controlling for variables, such as youth's feelings towards their parents and their own strengths and difficulties maintained a significant positive association between rumination

and NSSI. Other studies found that controlling for variables, such as approach behaviours in response to cues for reward, optimism, psychological distress, mental health diagnoses, sociodemographic factors and daily peer hassles, meant associations were no longer significant (Burke et al., 2015; Tanner et al., 2014; Xavier et al., 2018). This non-significant result (Xavier et al., 2018) may be due to the data being underpowered but may also suggest that these factors play an important role in the association between rumination and NSSI. Voon et al. (2014c) found that by statistically controlling for stressful life events, expressive suppression and cognitive reappraisal, only counterfactual thinking positively predicted NSSI and anticipatory thinking negatively predicted it. How anticipatory thinking may be conceptualised (e.g. future-oriented rumination) may be more akin to measures of worry rather than rumination, which may explain differences in the outcome with this subtype of rumination. This also highlights the need for clear distinctions between rumination subtypes (i.e. counterfactual thinking) and may explain any non-significant findings between state rumination (e.g. sadness) and NSSI found in Burke et al. (2015), Tanner et al. (2014) and Xavier et al.'s (2018) studies.

Only two longitudinal studies provided information on the association between rumination and NSSI (Barrocas et al., 2015; Voon et al., 2014a). Barrocas et al. (2015) found higher levels of sadness rumination at baseline to significantly predict higher NSSI frequency three months later, but not at 12 months. Voon et al. (2014a) reported no statistically significant relationship with general rumination when controlling for age, gender, suicide history, psychological distress, adverse life events and concurrent and prospective associations over a two-year period. Although Voon et al.'s study was underpowered, the findings suggest that high levels of sadness rumination may occur with NSSI, but longitudinal changes in sadness rumination (either increases or decreases) does not influence changes in NSSI.

Barrocas et al. (2015) determined three different trajectory classes of NSSI and found higher levels of rumination significantly increased adolescents' odds of being in a

moderate versus low NSSI trajectory class. However, rumination did not distinguish between membership of the low and chronic or chronic and moderate trajectory classes, despite the measure having a considerable overlap with depressive symptoms. It appears that moderate trajectory classes may show higher rumination, making NSSI more stable and higher over time. However, it should be noted that the chronic group consisted of relatively small numbers (n=29) compared to the moderate (n=161) or low trajectory (n=427) groups, suggesting the chronic group may be underpowered. Furthermore, the authors did not report on or account for characteristics of participants lost to follow-up, which may limit the representativeness of these findings.

Sadness or brooding rumination appear to be associated with NSSI, but it remains unclear as to how much of this is attributable to rumination. There is a lack of consistency across the studies in what variables are statistically controlled for when measuring this relationship. Furthermore, for all the studies assessing NSSI, only Xavier et al. (2018) reported a power calculation. The lack of acknowledgement for power has significant implications for interpretation of the results because it runs the risk of obtaining both false positive and false negative results (Button et al., 2013). Apart from Xavier et al.'s (2018) results many of the correlations between rumination and NSSI are small and therefore further replication of these findings are required to determine if a true association exists.

3.5.3 Association with substance use.

Two studies (Hilt et al., 2017; Skitch & Abela, 2008) found no significant concurrent correlations between rumination and substance use. Willem et al. (2011) however, found significant correlations as measured by the RAPI, which assesses experiences of negative consequences as a result of substance use, rather than the frequency of use. Therefore, the significant correlation may be with the young person’s rumination on the negative consequences of substance use, rather than the behaviour itself.

Distinct gender differences and type of substances were found to produce differences in these findings. There were significant correlations between ruminative

brooding and marijuana use for girls (r=.28), but not for boys (Adrian et al., 2014). Although cross-sectional in nature, these results indicate the importance of clear distinctions in types of substances used, as well as differences in these pathways for boys and girls.

Results seemed to be consistent when taking other variables into account. In a longitudinal study, rumination was not a significant predictor of later alcohol or substance use when controlling for factors such as sex, depressive symptoms, conduct problems and baseline alcohol use (Adrian et al., 2014; Hilt et al., 2017; Skitch & Abela, 2008). However, reflective rumination negatively predicted marijuana use (Adrian et al., 2014), which again highlights the need for clear conceptualisation and measurement of distinct rumination subtypes. These results suggest a role of ruminative brooding in the use of marijuana only, and the dampening effect of reflective rumination, which varies by gender.

Results differ when accounting for the interaction of rumination with relevant variables such as friends who use alcohol (Hilt et al., 2017) and stress levels (Skitch & Abela, 2008). Having more friends who use alcohol amplifies the relationship between rumination and frequency of alcohol use, while exposure to few friends who use alcohol dampens the association (Hilt et al., 2017). This longitudinal design provides support for the hypothesis that exposure to friends who use alcohol may be equally detrimental to adolescent boys and girls. Additionally, older adolescents with high rumination reported higher levels of substance use in response to high stress compared to low stress. Older adolescents with low rumination, on the other hand, reported lower levels of substance use during high stress than during low stress. For younger adolescents, the levels of substance use did not vary as a function of stress (Skitch & Abela, 2008). As a longitudinal multi-wave design, this study provided support for the hypothesis that a tendency to ruminate in response to stress is a vulnerability factor for substance use problems in older adolescents. Both studies suggest the significant role of social and situational factors in behavioural outcomes for ruminators.

An overreliance on self-report measures for all variables in the studies assessing substance use in adolescents may have masked outcomes if young people are reluctant to disclose any use of illicit substances. However, these results do suggest that contextual factors, including social networks and substance type, are important to consider in this research.

3.5.4 Associations with bulimic symptoms.

Only a single study included in this review reported on the association of rumination and eating difficulties. Holm-Denoma & Hankin (2010) used a multi-wave longitudinal analysis with adolescent girls and found moderate positive associations between sadness rumination and bulimic symptoms. After controlling for the association of baseline and later bulimic symptoms, sadness rumination significantly predicted later bulimic symptoms (β=.18). Conversely, after controlling for the association of baseline and later rumination, initial bulimic symptoms significantly predicted later rumination (β=.32). This suggests a reciprocal relationship between bulimic symptoms and rumination, where bulimic behaviours increase rumination, and rumination in turn increases bulimic behaviours. Although data was collected over a short period of time (10 weeks), the longitudinal nature allows for stronger inferences about the temporal precedence between rumination and bulimic symptoms. However, this still does not determine causality in the data.

3.5.5 Associations with general risky behaviour.

Auerbach, Kertz, & Gardiner (2012) used a measure of risky behaviour engagement but found no significant concurrent correlations between rumination and risky behaviour. The authors examined rumination as a moderator of the mediational pathway between stress and anxiety and found a significant association for boys, but not for girls. Although this may suggest an underlying cognitive vulnerability factor that may potentiate risky behaviour engagement in boys, the data is reliant on self-report measures, as well as the sum of engagement in a wide range of risky behaviours, including NSSI, rule breaking, substance use and destructive or illegal behaviours.

Table 5 *Outcome measures and subsequent associations reported between rumination and dysregulated behaviours; cross-sectional studies*

Author	Rumination measure	Behavioural measure	Outcome
Caprara et al. (2017),	Dissipation rumination scale (Caprara, 1986)	**Aggression:** Child Behaviour Checklist/6-18 (CBCL; Achenbach & Rescorla, 2001); Aggressive behaviour scale – Other (mother) report	No significant correlation between hostile rumination and aggressive behaviour (*r*=.16, *NS*). Rumination was grouped with irritability and emotional instability in the model; therefore, no direct associations of rumination and aggressive behaviour could be reported.
Del Bove, Caprara, Pastorelli, & Paciello (2008)	Hostile Rumination Scale (Caprara, 1986)	**Aggression:** Youth Self-report item (YSR; Achenbach, 1991); firesetting – Self-report Violence scale (Caprara, Mazzotti, & Prezza, 1990) – Self-report Covert antisocial scale (Capaldi & Patterson, 1989) – self-report	Hostile rumination predicted variation between control, aggressive and firesetting groups (F (3, 546) = 13.10, p = 0.000) Significant difference in hostile rumination between the control groups and the group high in aggression, between the control group and the group high in firesetting behaviours and between the control group and the group high in aggression and firesetting behaviours (all p<.02).
Francisco, Loios, & Pedro (2016)	Coping and Resilience questionnaire (C&R; Crespo & Francisco, 2011)	**Aggression:** Youth Self-report (YSR; Achenbach, 1991); aggressive behaviours, anxiety/depression and isolation/depression scales – Portuguese version – self-report	Significant positive correlation between rumination and aggressive behaviour *(r*=.331, *p*<.001) No direct effect between rumination and externalising behaviour (*β*=.10, *NS*)
Garnefski, Kraaij, & van Etten (2005)	Cognitive Emotion Regulation Questionnaire (CERQ; Garnefski, Kraaij, & Spinhoven, 2002); Rumination subscale	**Aggression:** Youth Self-Report (YSR; (Achenbach, 1991; Verhulst, Van der Ende, & Koot, 1997); delinquent and aggressive behaviour scales – self-report	No significant correlation between rumination and externalising problems. No significant association between rumination and externalising problems when controlling for gender, age and internalising problems.
Goodman & Southam-Gerow (2010)	Survey for Coping with Rejection Experiences (SCORE; Sandstrom, 2004);	**Aggression**:	Significant positive correlations between ruminative coping in the teasing scenario and aggressive coping in the exclusion scenario (*r*=.33, *p*<.01) and between ruminative coping in the exclusion

Author	Rumination measure	Behavioural measure	Outcome
	ruminative coping subscale.	Survey for Coping with Rejection Experiences (SCORE; Sandstrom, 2004); Aggressive coping subscale – self report	scenario and aggressive coping in the teasing scenario (r=.36, p<.01). Significant positive correlations between ruminative coping and aggressive coping are in the teasing scenario (r=.27, p<.05) and the exclusion scenario (r=.52, p<.01).
Harmon, Stephens, Repper, Driscoll, & Kistner (2017)	Children's response styles scale (Ziegert & Kistner, 2002) – rumination subscale Children's Anger rumination scale – Adapted from Anger Rumination Scale (Sukhodolsky et al., 2001)	**<u>Aggression</u>:** Peer nomination procedure (Crick & Grotpeter, 1995) – Peer-report - Three subscales: - Overt aggression - Relational aggression - Total aggression.	Significant positive correlation with anger rumination and aggressive symptoms (r=.28, p<.001) but sadness rumination was not correlated with aggression (r=-.06, *NS*) Anger rumination predicted aggression, controlling for age and sex (β=.28, p<.001) and the link between anger rumination and aggression remained significant after adding sadness rumination (β=.40, p<.001). Sadness rumination did not significantly predict aggression when only sex and age were in the model, however when anger rumination was added to the model, sadness rumination emerged as a significant negative predictor of aggression (β=-.21, p=.003). The interaction of sadness and anger rumination significantly added to the prediction of aggression (β=-.24, p<.001).
Mathieson, Klimes-Dougan, & Crick (2014)	Rumination scale created for the study, adapted from Rumination Scale of the Response Style Questionnaire (Nolen-hoeksema & Jackson, 2001)	**<u>Aggression</u>**: Child Social Behaviour Scale (Crick, 1996) – Teacher report	No significant correlation between relational aggression and rumination (t=.04, *NS*).
Patel, Day, Jones, & Mazefsky (2017)	Anger Rumination Scale (ARS; (Sukhodolsky et al., 2001)	**<u>Aggression</u>:** Early Adolescent Temperament Questionnaire – Revised (EATQ-R; Ellis & Rothbart, 2001) – self-report	Semi-partial correlation between anger rumination and aggression (r=0.41) when controlling for social responsiveness in participants with an Autism diagnoses. Significant association between anger rumination and aggression (β=0.40, p = 0.049) when controlling for social responsiveness.

Author	Rumination measure	Behavioural measure	Outcome
Peled & Moretti (2007b)	Sadness and Anger rumination inventory – designed for this study: 5-items from Conway et al.'s (2000) Rumination on Sadness scale, 4-items from Sukhodolsky et al.'s (2001) Anger Rumination Scale and 1 (intensification) item from Caprara's (1986) Dissipation-Rumination scale and a new intensification item was created	**<u>Aggression:</u>** Integrated Measurement Framework of Aggression (Little, Jones, Henrich, & Hawley, 2003); overt and relational aggression – self-report	Significant positive correlation between anger rumination and overt aggression (r=.48, p<.001) and relational aggression (r=.46, p<.001). Significant positive correlation between sadness rumination and overt aggression (r=.20, p<.05) and relational aggression (r=.33, p<.001). Anger rumination predicted overt aggression (β=.69, p=.001; B=.52, SE=.08, $p\leq$.001) and relational aggression (β=.46, p<.001; B=.29, SE=.08, $p\leq$.001) when controlling for anger and depression. When controlling only for depression, anger rumination still predicted overt aggression (β=.70, p-value not reported) and relational aggression (β=.46, p-value not reported). Sadness rumination negatively predicted overt aggression (β=.29, p=.001; B=-.21, SE=.08, p<.01) when controlling for anger and depression but did not predict relational aggression. When only controlling for depression, sadness rumination negatively predicted overt aggression (β=-.30, p-value not reported), but not relational aggression.
Rey Peña & Pacheco (2012)	Short Cognitive Emotion Regulation Questionnaire (short CERQ; Garnefski & Kraaij, 2006)	**<u>Aggression:</u>** Physical and Verbal Aggression Scale (AFV; Caprara & Pastorelli, 1993) – self-report	Rumination did not significantly predict physical-verbal aggression in girls. Rumination was a significant predictor of physical-verbal aggression in boys (β = -.31, p<.05)
Smith, Stephens, Repper, & Kistner (2016), study 1	Children's Anger Rumination Scale (CARS; Smith et al., 2016)	**<u>Aggression</u>**: Peer sociometric nominations (Crick, 1995; Crick & Grotpeter, 1995); relational and overt aggression – Peer-report Children's social behaviour scale – teacher form (CSBS-T; Crick, 1996) – teacher-report	Significant positive correlation between anger rumination and peer-rated overt aggression (r=.27, p<.05) teacher-rated overt aggression (r=.25, p<.05), peer-rated relational aggression (r=.27, p<.05) and teacher-rated relational aggression (r=.20, p<.05). Significant and positive association of anger rumination and peer-overt (β=.27, t=4.40, p<.001), peer relational (β=.26, t=4.22, p<.001), teacher-overt (β=.27, t=4.10, p<.001) and teacher-

Author	Rumination measure	Behavioural measure	Outcome
			relational (*β*=.19, *t*=3.00, *p*<.01) aggression after controlling for sex, age and family income.
Vasquez, Osman, & Wood (2012)	Angry Rumination scale (Sukhodolsky et al., 2001)	**Aggression**: Displaced aggression questionnaire (DAQ; Denson, Pedersen, & Miller, 2006) – self-report Aggression Questionnaire (Buss & Perry, 1992) – self-report	Significant positive correlation between rumination and trait aggression (*r*=.55, *p*<.01) and between rumination and trait displaced aggression (*r*=.65, *p*<.01) There was a direct effect of rumination on displaced aggression (*β*=.65, *p*<.01), controlling for gang affiliation. After controlling for trait hostility, trait anger, trait aggression and irritability, rumination remained a significant predictor of displaced aggression (*β*=.41, *p*<.01; *b*=.18, *p*<.01)
Tanner, Hasking, & Martin (2015)	Ruminative thought style questionnaire (RTSQ; Brinker & Dozois, 2009) –	**NSSI:** Self-harm behaviour questionnaire – Part A (SHBQ-A; (Gutierrez, Osman, Barrios, & Kopper, 2001) – self-report **Fire-setting**: Single question: "How many times have you set fire you something you weren't supposed to?" (1-2x, 3-5x, 6+, never) – self-report	Repetitive and anticipatory rumination were not significant predictors of group membership for NSSI or firesetting. Problem focused rumination was a unique predictor of belonging to NSSI group (OR=1.04, CI [1.00 – 1.08], *p*<.05) but not firesetting group. Counterfactual rumination was a unique predictor of belonging to NSSI group (OR=1.05, CI [1.01 – 1.10] p<.05) but not the firesetting group. Repetitive thoughts and anticipatory thoughts were not a unique predictor of the NSSI or firesetting group.
Burke et al. (2015)	Ruminative responses scale (Treynor et al., 2003); brooding subscale	**NSSI**: Form and Function Self-Injury scale (FAFSI; Jenkins & Schmitz, 2012)– self-report	Significant and positive correlation between brooding and NSSI lifetime frequency (*r*=.16, *p*<.05) and past year frequency (*r*=.18, *p*<.05). No significant direct effects of brooding on NSSI (lifetime or past year frequency) when controlling for BAS risk group.
Tanner, Hasking, & Martin (2014)	Ruminative Thought style questionnaire (RTSQ; (Brinker & Dozois, 2009)	**NSSI** Self-Harm Behaviour Questionnaire – Part A (SHBQ-A; Gutierrez et al., 2001) – self-report	NSSI was positively correlated to rumination (*r*=0.21, *p*<.001)

Author	Rumination measure	Behavioural measure	Outcome
Voon, Hasking, & Martin (2014c)	Ruminative Thought Style Questionnaire (RTSQ; (Brinker & Dozois, 2009)	**NSSI:** Self-Harm Behaviour Questionnaire – Part A (SHBQ; Gutierrez et al., 2001) – self-report	All four subscales of the RTSQ were correlated with NSSI; problem-focused thoughts (*r*=.23, *p*<.01), counterfactual thinking (*r*=.17, p<.01), repetitive thoughts (r=.17, *p*<.01) and anticipatory thoughts (r=.06, *p*<.01). NSSI had direct relationships with counterfactual thinking (β=.07, p <.01) and anticipatory thinking (β=-.05, *p*<.05).
Xavier, Cunha, & Pinto-Gouveia (2018)	Ruminative Responses Scale – short version (RRS; Treynor et al., 2003); Portuguese version for adolescents: (Ana Xavier, Cunha, & Pinto-gouveia, 2019) –	**NSSI:** Risk-taking and Self-harm inventory for adolescents (RTSHIA; Vrouva, Fonagy, & Roussow (2010); Portuguese version; Xavier, Cunha, Pinto-Gouveia, & Paiva (2013) Xavier et al., 2013) – self-report Items 32 and 33 (measures of suicidal ideation and intent) were not included in overall sum of NSSI.	Significant and positive correlations for NSSI and brooding for males (*r*=.38, *p*<.001) and females (*r*=.24, *p*<.001) The direct effect of brooding on NSSI was not significant (*b*=-.012, SE=.056, Z=-0.217, *p*=.828, *β*=-.01) when controlling for daily peer hassles
Willem, Bijttebier, Claes, & Raes (2011)	Ruminative Responses Scale (RRS; Nolen-Hoeksema & Morrow, 1991)	**Substance use:** Alcohol Use Disorder Identification Test (AUDIT; (Saunders, Aasland, Babor, Fuente, & Grant, 1993) – self-report Drug use disorder Identification Test (DUDIT; Berman, Bergman, Palmstierna, & Schlyter, 2005) – self-report Rutgers Alcohol Problem Index (RAPI; White & Labouvie, 1989) – self-report.	No significant association of rumination (brooding) and drug or alcohol use as measured by the AUDIT-C. Significant positive association for behaviours associated with alcohol/drug use as measured by the RAPI (*r*=.15, *p*≤.05). Rumination (reflection) was not significantly associated with alcohol use, but slight negative association with drug use (*r*=-.14, *p*=.06). Substance use problems (as measured by the RAPI) were predicted by high brooding (*β* = .25, *p* ≤.001) when controlling for age, gender and reflection, which did not disappear when controlling for depressive symptoms (*β* = .21, *p*≤.05)

Table 6 *Outcome measures and subsequent associations reported between rumination and dysregulated behaviours; longitudinal studies*

Authors	Rumination measure	Behavioural measure	Outcome
Caprara, Paciello, Gerbino, & Cugini (2007)	Hostile Rumination Scale (Caprara et al., 1990)	**Aggression**: Physical and Verbal Aggression Scale (Caprara & Pastorelli, 1993) – self-report - behaviours aimed at physically (3-items) and verbally (3-items) hurting others. Note: At times 1 and 2, used a 3-point scale and a 5-point scale in the last three assessments. Violence scale (Caprara et al., 1990) – self-report – engagement in violent conduct - 11-irems	Significant concurrent correlations between HR and verbal aggression at Time 1 for girls (r=.36, p<.001) and boys (r=.28, p<.001) and Time 3 for girls (r=.32, p<.001) and boys (r=.23, p<.001). Significant concurrent correlation between HR and physical aggression at Time 1 for girls (r=.36, p<.001) and boys (r=.37, p<.001) and at Time 3 for girls (r=.23, p<.001) and boys (r=.35, p<.001). Significant concurrent correlation between HR and violence at Time 3 for girls (r=.37, p<.01) and boys (r=.18, p<.01). Significant predictive correlations between HR at Time 1 and verbal aggression at Time 3 for girls (r=.17, p<.01) and boys (r=.14, p<.05). Significant predictive correlations between HR at Time 1 and physical aggression at Time 3 for girls (r=.13, p<.05) and boys (r=.23, p<.05). Significant predictive correlations between HR at time 1 and violence at Time 3 for girls (r=.26, p<.01) and boys (r=.25, p<.01). Hierarchical regressions were only calculated for Time 1 HR to Time 5 physical, verbal aggression and violence. As Time 5 did not fit the inclusion criteria for this review, the results are not reported here.
McLaughlin, Hatzenbuehler, Mennin, & Nolen-Hoeksema (2011)	Children's Response Style Questionnaire (CRSQ; Abela, Brozina, & Haigh, 2002)	**Aggression:** Revised Peer Experiences Questionnaire (RPEQ; Prinstein, Boergers, & Vernberg, 2001)– self-report	Significant concurrent correlation for rumination and aggressive behaviour at Time 1 (r=.16, p<.01) and Time 2 (r=.28, p<.01). Significant predictive correlation for Time 1 rumination and Time 2 aggression (r=.17, p<.01) as well as for Time 1 aggression and Time 2 rumination (r=.17, p<.01)

Authors	Rumination measure	Behavioural measure	Outcome
			SEM analysis of longitudinal data did not account for rumination separately (emotion dysregulation consisted of combined measures of 'dysregulated anger', 'dysregulated sadness' and 'emotional understanding').
McLaughlin, Aldao, Wisco, & Hilt (2014)	Children's Response Style Questionnaire (CRSQ; Abela et al., 2002)	**Aggression:** Revised Peer experiences questionnaire (RPEQ; Prinstein et al., 2001) – self-report	Significant concurrent correlations between rumination and aggressive behaviour at Time 1 (r=.16, p<.01) and Time 3 (r=.28, p<.01). Significant predictive correlations at Time 1 rumination and Time 3 aggression (r=.17, p<.01) and Time 2 rumination and Time 3 aggression (r=.20, p<.01), as well as at Time 1 aggression and Time 2 rumination (r=.17, p<.01) and Time 1 aggression and Time 3 rumination (r=.28, p<.01). Rumination at Time 2 predicts aggressive behaviour at Time 3, whilst controlling for Time 1 anxiety, rumination and aggression (β=.20, p<.05). Aggression at Time 1 predicts rumination at Time 2, controlling for Time 1 rumination and anxiety (β=.18, p<.05).
Smith et al. (2016); study 2	Children's Anger Rumination Scale (CARS; (Smith et al., 2016)	**Aggression:** Number of behavioural write-ups for rule violations incurred while incarcerated (ranging from minor to major violations) – research assistants coded the behaviours into 12 different categories –4 aggressive behaviour categories: physical aggression, verbal aggression, threatening behaviour and sexual behaviour were summed each month	Anger rumination scores were correlated with aggression at month 0 (r=.25, p<.05) but not at months 1-4, or with total number of offences.
Adrian, McCarty, King, McCauley, & Stoep (2014)	Ruminative Responses Scale (RRS; Nolen-Hoeksema & Morrow, 1991; Treynor et al., 2003)	**Aggression**: Child Behaviour Checklist (CBCL; Achenbach & Rescorla, 2001); externalising scale– parent-report	Significant correlation between brooding and marijuana use (r=.28, p≤.05) and externalising symptoms (r=.19, p≤.01) for girls, but no significant correlation between brooding and alcohol use.

Authors	Rumination measure	Behavioural measure	Outcome
		Substance use: Rutgers Alcohol Problem Inventory (RAPI; White & Labouvie, 1989)– 1 item: ("during the past 6 months, did you use alcohol (beer, wine, hard liquor) or marijuana or both?") Diagnostic Interview Schedule for children (DISC-IV) (Columbia University DISC Development Group, 1998) – determine the presence of alcohol/marijuana abuse/dependence.	No significant correlation between brooding and alcohol/marijuana use or conduct problems for boys. No significant correlation between reflective rumination and alcohol use (r=-.08, ns; r=-.14, *ns*) and marijuana use (r=.04, *ns*; r=.09, *ns*) for girls and boys respectively. When controlling for sex, depressive symptoms and conduct problems in 8th grade, substance use in 12th grade was not significantly predicted buy ruminative brooding (β=.13, NS; b=.04, *ns*, SE=.03) or reflection (β=.04, *ns*; b=.01, SE = .03) in 9th grade. When controlling for gender, depressive symptoms and conduct problems in 8th grade, alcohol use in 12th grade is not significantly predicted by 9th grade brooding (b=.03, *ns*, SE=.03), but is significantly predicted by 9th grade reflection (b=-.06, $p\leq$.05, SE=.03) Marijuana use in 12th grade was significantly predicted by ruminative brooding in 9th grade (b=.11, $p\leq$.05, SE= .03), and reflection in 9th grade (b=-.05, $p\leq$.05, SE = .03) when controlling for sex, depressive symptoms and conduct problems at 8th grade.
Hilt, Armstrong, & Essex (2017)	Ruminative response scale (Nolen-Hoeksema & Morrow, 1991)	**Substance use:** Alcohol use – 1 item (developed for the study) – self-report - Have they consumed alcohol? If so, how much in the past month?	No significant correlation between Grade 9 rumination and Grade 9 (r=.08, *ns*) or Grade 11 (r=.08, *ns*) alcohol use. Grade 9 rumination did not significantly predict grade 11 alcohol use (B=.21, *ns*, SE=.45) when controlling for grade 9 alcohol use and grade 9 internalising symptoms.
Skitch & Abela (2008)	Responses to Stress Scale (RSS; (Connor-Smith et al., 2005)	**Substance use:** Substance Misuse Severity Measure (SMSM; developed for this study) – self-report	No significant correlation between rumination and substance misuse scores (r=.03, *ns*). Rumination was not a significant predictor of substance misuse.

Authors	Rumination measure	Behavioural measure	Outcome
Barrocas, Giletta, Hankin, Prinstein, & Abela (2015)	Ruminative response scale (RRS) of the Response Style Questionnaire (RSQ; (Nolen-Hoeksema & Morrow, 1991)	**NSSI:** NSSI measure (Prinstein et al., 2008) – self-report -	Reporting higher levels of rumination significantly increased adolescents' odds of being in the moderate versus the low NSSI trajectory class (OR=1.04, p<.01, CI [1.01 – 1.06]). Rumination did not significantly determine difference between chronic and low NSSI trajectory group and chronic and moderate NSSI trajectory group.
Voon, Hasking, & Martin (2014a)	Ruminative thought style questionnaire (RTSQ; Brinker & Dozois, 2009) – 20 items.	**NSSI:** Self-Harm Behaviour Questionnaire – Part A (SHBQ-A; (Gutierrez et al., 2001) – self-report	Significant correlation between NSSI and problem-focused thoughts (r=.22, p<.01) but not counterfactual thinking, repetitive or anticipatory thoughts at baseline. Comparing groups over time, self-injurers had significantly higher means in all four types of rumination at Time 1 (p<.01), but both groups reported significant increases over time in counterfactual thinking ($NSSI_{SLOPE}$ = 1.19, p<.001; Non-$NSSI_{SLOPE}$ = 1.40, p<.001) and repetitive thoughts ($NSSI_{SLOPE}$ = 1.13, p<.001; Non-$NSSI_{SLOPE}$ = 1.21, p<.001). Non-self-injurers reported increases in problem focused thoughts, although not statistically different from self-injurers. When controlling for gender, age, suicide history, psych distress, adverse life events and concurrent or prospective associations among emotion regulation processes, changes in rumination did not significantly predict NSSI.
Bjarehed & Lundh (2008)	Emotion Regulation Questionnaire for Adolescents (ERQA) (no reference provided)	**NSSI:** Deliberate self-harm inventory: 9-item version (DSHI-9; adapted to adolescents by (Lundh, Karim, & Quilisch, 2007) – self-report **Substance use:** One question: Do you drink alcohol? 6 responses ranging from 'no' to 'several times each week' – self-report	Significant positive correlation between NSSI and rumination/negative thinking at Time 1 (girls: r= .45, p<.001, boys: r=.27, p<.001) and Time 2 (girls: r=.47, p<.001, boys: r=.38, p<.001) No report on correlations between rumination and substance use or eating difficulties. Unique effects were found between rumination and self-harm (β=.21, p=.017) at Time 1, controlling for feelings towards parents and strengths and difficulties.

Authors	Rumination measure	Behavioural measure	Outcome
		Eating difficulties: Risk behaviours for eating disorder (Waaddegaard, Thoning, & Petersson, 2003) – self-report	Unique effects were found between rumination and self-harm (*β*=.31, *p*<.001) at Time 2, controlling for feelings towards parents and strengths and difficulties.
Holm-Denoma & Hankin (2010)	Children's Response Style Questionnaire (CRSQ; Abela et al., 2002)– based on Response Styles Questionnaire (Nolen-Hoeksema & Morrow, 1991)	**Eating difficulties:** Eating Disorder Diagnostic Scale (EDDS; Stice, Telch, & Rizvi, 2000)– self-report	Concurrent correlations: Significant positive association between rumination and bulimic symptoms at Time 1 (*r*=.17, *p*<.01) and at Time 3 (*r*=.29, *p*<.001). Predictive correlations: Significant positive association between rumination at Time 1 and bulimic symptoms at Time 2 (*r*=.15, *p*<.05) and at Time 3 (*r*=.27, *p*<.001). Significant positive association between rumination at Time 3 and bulimic symptoms at Time 2 (*r*=.30, *p*<.001) at Time 1 (*r*=.35, *p*<.001). Time 1 rumination predicted Time 3 bulimic symptoms for adolescent girls (*β*=.18, *p*<.001) after controlling for Time 1 and Time 2 bulimic symptoms. The association between Time 1 rumination and Time 3 bulimic symptoms was no longer significant after including physical appearance competence as a mediating factor (*β* decreased from .18, *p*<.001-.09, *ns*) After controlling for Time 1 rumination onto Time 3 rumination, initial bulimic symptoms predicted Time 3 rumination (*β*=.32, *p*<.001).
Auerbach, Kertz, & Gardiner (2012)	Responses to Stress Scale (RSS; (Connor-Smith et al., 2005) – 57 items – self-report – analysis focused on the rumination subscale.	**Risky behaviour:** Risky Behaviour Questionnaire – Adolescents (RBQ-A; Auerbach & Gardiner, 2012) – self-report	No significant correlation between rumination and risky behaviour for boys (*r*=.19, *ns*), girls (*r*=.17, *ns*) or total sample (*r*=.02, *ns*) at baseline. No predictive correlations reported. No direct association of rumination on risky behaviours reported.

4.Discussion

4.1 Differential association between rumination and dysregulated behaviours

This review aimed to explore in children and adolescents any associations between different types of rumination and dysregulated behaviours that are often linked to BPD. The objectives were to identify the different types of rumination measured in children and adolescents in the literature, to explore any associations between these and behaviours associated with BPD and finally, to report on the quality of the literature. In the current review, analysis was grouped by behavioural subtype and the unique measures of rumination were considered. The findings from this systematic review state that firstly, the array of outcome measures for rumination highlight that it is not a unitary construct, and there is increasing understanding of rumination being multifaceted and multidimensional (Smith & Alloy, 2009). Secondly, the review highlights the differential associations the types of rumination may have with a range of dysregulated behaviours observed in young people. Significant associations were reported for NSSI, aggression and bulimic behaviours for various types of rumination, whereas substance use was less consistent in outcomes. Finally, key variables influencing the role of rumination were identified in this review. These findings will be discussed in the context of the current literature, theory and practice.

The studies included in this review suggest rumination to be an umbrella term for distinct constructs associated with unique behavioural correlates. Watkins (2008) suggests that there are a number of factors that differentially impact the influence of rumination on psychological outcomes, including valence of thought, temporal orientation, controllability and cognitive-affective context in which it occurs. Many of the studies focused on the valence of rumination, whether that be internally directed (self, mood) or externally directed (in response to an emotionally salient event), whilst some studies focused on the ruminative process independent of the emotional content. For example, firesetting behaviour did not show significant associations with rumination when using a measure that is less biased by valence (RTSQ) as opposed to an affect-laden measure of anger rumination.

The main finding from this review was that associations were found between emotion focused rumination types and behaviours related to BPD. These findings are supported by results in the adult literature reporting on associations between emotion focused rumination and dysregulated behaviours (Armey & Crowther, 2008; Bushman, 2002; Pedersen et al., 2011; Selby et al., 2008). These outcomes are important because it demonstrates that behaviours often associated with the diagnosis of BPD are influenced not just by the occurrence of negative affect, but by the ruminative thinking of it. This is in line with Baer & Sauer (2011) who found that BPD severity was influenced both by the occurrence of negative affect and ruminative thinking about it. To understand the intricacies of rumination and the associated behaviours is important for tailoring treatment interventions. The reason that a person has for engaging in a specific type of rumination may vary from those identified in the current literature for depressive rumination.

Rumination, which is focused on negative affect or experiences may therefore be an ineffective coping strategy that may increase the externalising symptoms connected with BPD. The current diagnostic criteria for BPD allows for 256 different combinations of symptoms that lead to a diagnosis (Biskin & Paris, 2012). The different rumination subtypes may explain the various behavioural presentations often portrayed in people meeting criteria for this diagnosis, including NSSI, aggression and binge eating. The association of rumination and behavioural dysregulation outlined in the current review is in line with the emotional cascade theory, which identifies a mediating role of rumination between emotional and behavioural dysregulation in BPD presentations (Selby et al., 2009). The theory states that rumination on negative emotion progressively builds emotional intensity via a positive feedback mechanism. If uninterrupted, emotional intensity continuously increases until adaptive emotion regulation strategies fail to reduce it. Engagement in the dysregulated behaviour short circuits the emotional cascade via negative feedback, thus halting rumination. However, this model does not distinguish between the different constructs of rumination and the differential pathways to the corresponding behaviours.

As well as the unique effects of the emotion focused rumination, the interacting effects of these constructs may influence behavioural outcome. Only two studies in this review controlled for the effect of one type of rumination, when assessing the effect of another. Sadness rumination alone may not be associated with aggression, but when anger rumination was considered, sadness rumination had a dampening effect on aggression. This finding is supported by a recent study exploring the differential association of sadness rumination and anger rumination to internalising and externalising psychopathology in young adults (du Pont, Rhee, Corley, Hewitt, & Friedman, 2018). Rumination has been previously linked to several different affects in the literature (Thomsen, 2006), but this may be because these affects are interrelated (Watson & Clark, 1992). The intertwining of anger and sadness rumination is evident in the adult literature, particularly in the context of BPD (Baer & Sauer, 2011).

Anger rumination has been shown to be highly correlated with BPD (Baer, Peters, Eisenlohr-Moul, Geiger, & Sauer, 2012) and therefore it is important to recognise the early presentations of this construct in children and adolescents. The results of this current review highlight the specificity of anger and sadness rumination to aggressive behaviour in youths, but in opposite directions. A focus on anger in adolescents may increase physiological arousal and increase the likelihood of the youth engaging in aggressive behaviours. A focus on sadness on the other hand, even in the context of anger rumination may reduce physiological arousal and subsequently reduce aggressive behaviours. It is unclear whether these young people would then adopt another type of dysregulated behaviour. The specificity of these two types of rumination are consistent with the line of thinking implicit in Response Styles Theory (Nolen-Hoeksema, 1991). Rumination prolongs distress via focus on the self and symptoms, which increases the current negative mood state. The thoughts encourage feelings of hopelessness and decrease the likelihood of the person using adaptive behavioural and cognitive strategies, which may lead to NSSI or other self-destructive behaviours.

Rumination may be distinguished as a range of variables related to process and content (Segerstrom, Stanton, Alden, & Shortridge, 2003). The majority of measures for rumination used by the studies in this review focused on the qualitative differences in rumination arising from the content. The RTSQ, on the other hand, is used by four studies in this review and is reported to be less biased by valence, content or temporal orientations and assesses an overall level of repetitive thinking (Brinker & Dozois, 2009). The RTSQ specifically found that higher problem-focused and counterfactual types of ruminative thinking may be associated with higher levels of NSSI. The significance of these ruminative subtypes implies that it is not only the emotional content of the thinking that influences the behavioural outcomes, but the thinking style of the person.

Problem-focused thinking is consistent with the traditional conceptualisations of rumination, relating to attempts to problem-solve the negative emotion. Counterfactual thinking refers to thinking about alternative outcomes (Tanner, Voon, Hasking, & Martin, 2013) and is integral to underlying emotions of regret (Kahneman & Miller, 1986), shame and guilt (Niedenthal, Tangney, & Gavanski, 1994) . Based on these conceptualisations of the thinking styles, the negative affect may still be captured by the measure, which may differ from person to person. The person's emotional response may be determined by their individual beliefs about the self and the world (Beck & Weishaar, 1989).

An interesting finding from a longitudinal study in the current review is that change in a general tendency to ruminate does not seem to influence change in NSSI, or vice versa, over time. As discussed above, the measure of rumination (RTSQ) assessed a general tendency to ruminate rather than a negatively valenced style of thinking. Young people may have initially engaged in NSSI to escape a negative mood, which may have been exacerbated by a problem-focused rumination style thus leading to the significant baseline associations. Engagement in NSSI behaviours increases negative affect through contributing to aversive self-awareness (Armey & Crowther, 2008), which may ultimately increase rumination. However, the repeated testing of the RTSQ may not have picked up

this perseverative style of thinking following NSSI in response to other emotions, such as guilt or shame.

In addition to the negative consequences of rumination, this review also identified some protective factors related to a ruminative style of thinking; higher anticipatory thinking was associated with lower levels of NSSI. Contrary to the narrative of rumination being an unhelpful thinking style, this outcome suggests that some subtypes of rumination may be helpful for the person in some situations. Anticipatory thinking has been shown to be a protective factor from psychological distress and had a positive contribution to productive coping (Tanner et al., 2013). On the surface, as a form of future oriented, intrusive and uncontrollable thinking, anticipatory thinking resembles worry (Borkovec, Ray, & Stöber, 1998). However, unlike anticipatory thinking, worry can exacerbate poor psychological outcomes (Hong, 2007). Anticipatory thinking may be a form of ruminative thinking that is beneficial in identifying strategies and resources to cope with future eventualities. Similarly, reflective rumination produced negative, although not always significant associations with substance use behaviours. Reflective rumination has been described as “a purposeful turning inward to engage in cognitive problem solving to alleviate one’s depressive symptoms” (Treynor et al., 2003, p. 256). Thus, rumination characterised by a style of thought rather than negative content does not produce significant associations with dysregulated behaviours. However, it is unclear from the present review about the positive correlates of this style of thinking or whether it may lead to an alternative form of dysregulated behaviour.

The review also highlights the mixed evidence on whether rumination is associated with substance use in children and adolescents. Given the non-significant correlations between substance use and rumination, this may be explained by the type of rumination measured in this review, which was rumination to sadness or stress. Previous findings have supported an association between substance use and anger rumination, but not sadness rumination (Ciesla et al., 2011). However, several studies indicated that rumination may interact with other variables, including gender, substance type, peers who use alcohol and

stress levels. Females reported higher levels of rumination, which is associated with higher marijuana use, which was not reported in males. This is supported by research with adult populations, which found cannabis use to be associated with psychological distress in women (Danielsson, Lundin, Allebeck, & Agardh, 2016). It may be that girls are using marijuana to escape negative thoughts and emotions whereas boys are using it for social purposes (Green, Kavanagh, & Young, 2004). However, reasons for marijuana use as well as other factors that may influence use, such as peer affiliations and childhood adversity (Fergusson & Horwood, 1997) were not measured in the studies included in this review.

One potential implication for this review is understanding some of the factors that interact with rumination to increase young people's risk in engaging in dysregulated behaviours. Gender and age were often controlled for in the analyses of the studies included in this review. Girls have been shown to ruminate more often than boys (Garnefski, Teerds, Kraaij, Legerstee, & van den Kommer, 2004) and children increasingly use more rumination into adulthood (Garnefski, Legerstee, Kraaij, van den Kommer, & Teerds, 2002). Other variables that were considered varied greatly across the studies and therefore makes it difficult to form comparisons. However, certain variables that produced outcomes of note were peer engagement in the behaviour and stress levels. Knowing more people who used alcohol increased the young person's likelihood of using alcohol, whilst knowing few friends who used alcohol was a dampening effect (Hilt et al., 2017). Older adolescents with low rumination reported lower levels of substance use during high stress, whereas the older adolescents with high rumination reported higher levels of substance use in response to high stress. Therefore, contextual factors are important to consider in the role of rumination and dysregulated behaviours. Future research may wish to replicate and build on these findings in children and adolescents.

4.3 Measures of rumination and dysregulated behaviour

In addition to the fact that there were only a small number of studies per type of behaviour that were eligible for inclusion of this review, it is unfortunate that most of the

studies utilised different measures of rumination. Furthermore, for those studies using similar measures, different versions of the questionnaire were employed. The Anger Rumination Scale (Sukhodolsky et al., 2001) for example was used across two studies (Patel et al., 2017; Vasquez et al., 2012), whereas a modified version for children and adolescents was utilised in three studies (Harmon et al., 2017b; Smith et al., 2016; study 1; study 2). These differences in how rumination was measured means it is difficult to compare results across studies but does not nullify the findings.

As well as different measures of rumination, the questionnaires utilised in the studies seem to operationalise rumination differently, such as at a state level or a trait level. State rumination may be in response to an initial negative affect, whilst trait rumination reflects the general tendency of the person to ruminate. Measures of state rumination are consistent with Nolen-Hoeksema's (1991, 2000) definition of rumination on self and symptoms. If one focuses on symptoms and self while in a sad mood, their sadness will increase, whereas focusing on symptoms and self in an angry mood leads to increases in anger. The difficulties that then arise in the measurement of state level rumination is whether the affect is being captured as well as the cognitive construct of rumination. For example, the Response Styles Questionnaire (RSQ; Nolen-Hoeksema & Morrow, 1991) has been criticised due to items reflecting depression rather than rumination (Conway et al., 2000; Treynor et al., 2003). This has implications for any conclusions based on the significant associations observed between rumination and the behaviour, as the variance may be explained more by the emotion rather than the construct of rumination.

The focus on specific thought content and context may inflate the relationship between rumination and the outcomes under investigation. The RTSQ (Brinker & Dozois, 2009) is possibly the closest measure of those used in this review to differentiate types of rumination. The sub-categories focus on different facets of rumination, including problem-focused thoughts, repetitive thinking, anticipatory thinking and counterfactual thinking. It is a measure of dispositional ruminative thinking style not specifically linked to mood state or life circumstance and identifies potentially helpful and unhelpful aspects of rumination.

Therefore, this measure recognises the overall level of repetitive thinking that the individual engages in and subsequent qualitative differences in the separate dimensions (Tanner, Voon, Hasking, & Martin, 2013).

In summary, it is vital for future research to incorporate and distinguish between the multiple factors, as well as the different types of rumination. Considering this, any conclusions from the studies in this review ought to be considered in the context of how and what type of rumination is being measured.

4.2 Quality Framework

All the studies included in this review were assessed using a quality assessment tool which highlighted that the overall quality of the literature was varied, as one would expect for studies spanning 13 years. For studies with a lower quality rating, the common reasons were external validity and reporting of power.

Low scores for external validity reflect a lack of specificity regarding recruitment and representativeness of the sample to the population. Knowledge of whether the participants were reflective of the larger population can support our understanding of the level of generalisability possible from the outcomes measured. It also impacts upon replicability, which is fundamental for any phenomena to be considered real or very probable (Schmidt, 2009).

Consistent with previous findings in the general literature (Fritz, Scherndl, & Kühberger, 2012; Szucs & Ioannidis, 2017) only a single study in this review reported power calculations. Low statistical power in combination with a small effect size, could not only lead to a large number of Type II errors, but the possibility of a proliferation of Type I errors (Rossi, 1990). Caution must therefore be taken in interpreting studies with insufficient power for the statistical analysis.

The studies included in this review tended to receive higher quality ratings for the internal validity. The included the lack of ‘data dredging’ and the use of unplanned post hoc

analyses. This suggests a consideration in advance of the potential impact of variables in the analysis.

4.5 Clinical and Research Implications

The results of this review highlight the concept that rumination is not only multifaceted, but that various types of rumination may play a contributory or protective role with a range of behavioural outcomes associated with BPD in children and adolescents. What remains unclear is how this repetitive, recurrent, uncontrollable and intrusive thinking style can influence these outcomes, and in what direction this influence flows. This supports the idea that qualitative differences in rumination may be integral to consider in future research using longitudinal designs to explore the pattern of these associations.

There is an abundance of instruments used in the current studies to measure rumination. It is possible that the proliferation of these tools obscures how rumination may be related to behavioural outcomes. Some are focused on specific thought content and emotions, such as anger, which may inflate the relationship between rumination and the outcomes under investigation. There has been a predominant focus of rumination as enhancing symptoms of distress, but the current review highlights subtypes of rumination that may be protective. As mentioned previously, Watkins (2008) suggests that there are several factors that may impact the influence of rumination on psychological outcomes, including valence of the content. Whilst it would be helpful to have information regarding affect alongside rumination in clinical practice, the inclusion of these items in measures of rumination may lead to altered or conflicting results in research settings when comparing summative scores to externalising or internalising pathology. Therefore, future research ought to examine both ruminative thought processes and content associated with various behaviours and be transparent in their conceptualisation of the construct being measured. Understanding the specific subtypes of rumination and the role that they may have in mental health can inform clinical practice in separating the more unhelpful ruminative processes and promoting the helpful subtypes.

The results in the current review suggest that rumination is present from an early age and may be linked with further difficulties, thus indicating a crucial time point for early intervention. This is supported by previous research that has found adolescence to be a period where rumination and other maladaptive strategies increase (Hampel & Petermann, 2005; Jose & Brown, 2008). Therefore, treatment interventions that focus on rumination in children and adolescents may be beneficial in terms of reducing long term difficulties, such as BPD. To establish a clear developmental pathway for the use of rumination however, robust longitudinal research is required from primary school age to adulthood. Understanding the development, onset and role of rumination in psychopathology can help inform the development of tailored interventions.

The leading treatments for BPD traits in children and adolescents are currently Cognitive Behavioural Therapy (CBT) and Dialectical Behaviour Therapy (DBT). Both models may implicitly address rumination through strategies such as mindfulness. Mindfulness is a practice that teaches participants to pay attention to present moment experiences in a non-judgemental way (Kabat-Zinn, 2009). Acceptance and Commitment Therapy (ACT) also uses mindfulness approaches to promote psychological flexibility. The person is encouraged to stay in contact with the present moment and to become unstuck from difficult experiences that may be preventing the person from engaging in valued action (Harris, 2009). There is currently a limited evidence base for ACT with BPD difficulties (Gratz & Gunderson, 2006; Morton, Snowdon, Gupold & Guymer, 2012; Ost, 2014), however, these initial studies suggest ACT may be beneficial for this population.

Mindfulness has been shown to reduce symptoms of distress through reducing anger and sadness ruminative processes (Borders et al., 2010; Kingston, Dooley, Bates, Lawlor, & Malone, 2007; Peters et al., 2015). Whether the same results would arise with other rumination types mentioned in this review is unclear. However, differentiation of rumination in the current review has highlighted the adaptive aspects of this construct (e.g. reflection or anticipatory thinking). Further research could focus on developing an understanding of the adaptive features of rumination and ways of promoting these in young people.

A clearer understanding of ruminative processes and their links to behaviour is needed to refine the treatment approach. However, clear indications of rumination in children supports the benefits of mindfulness approaches being encouraged from an early age.

4.6 Limitations of the Current Review

The design of this review has several limitations, which will now be considered further. Firstly, the criteria for study selection required that the publication must be available in English. This may have limited the inclusion of data from other studies that have not been translated into English. Similarly, the criteria allowed only for studies that have been peer reviewed, thus limiting the inclusion of non-peer reviewed studies and possibly leading to publication bias. It is more likely that articles published in peer-reviewed journals would have included that any interventions are effective (Petticrew & Roberts, 2006). On the other hand, only including peer reviewed studies ensures a baseline quality of research being reviewed and reduces potential bias in the conclusions.

Secondly, the review is selective in only including studies reporting on a direct association of rumination and a dysregulated behaviour, which has produced only a very limited evidence base. However, inclusion of mediation and moderation analysis may have provided a richer picture of the role rumination has in dysregulated behaviour in the context of other variables. Further research could aim to replicate the measurement of additional variables that have been suggested to play a role in the association between rumination and dysregulated behaviours.

4.7 Conclusion

Rumination is not simply a non-specific factor that is associated with psychopathology, but a specific multifaceted risk factor that differentially promotes certain externalising behaviours. From the evidence that has been gathered, it may be posited that various subtypes of rumination play contributory and protective roles in dysregulated behaviour. The findings have also helped to highlight some of the potential mediators or moderators of this association. A clear conceptualisation of the type of rumination being

studied is needed. That way, in future research, one can build on the current findings to help understand the role rumination has in the dysregulated behaviours related to BPD in children and adolescents.

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Chapter 2: Empirical study

Borderline Personality Traits and Emotion Regulation Strategies in Adolescents: The role of Implicit Theories

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Abstract

Background: The current study examined how people's belief about the malleability of emotions is associated with Borderline Personality Disorder (BPD) traits and cognitive emotion regulation strategies in adolescents. We predicted that young people with a more fixed belief of emotion would be less motivated to engage in psychological therapies because they might not believe that changing emotions is within their control. We tested whether adolescents would be more likely to report adopting cognitive emotion regulation strategies that are associated with positive wellbeing (i.e. cognitive reappraisal) rather than strategies that are often associated with poorer mental health (i.e. rumination) after receiving a message promoting the changeability of emotion through a virtual reality (VR) game.

Method: A sample of 29 adolescents (ages 14-17 years, 67% female) were recruited from two adolescent inpatient units for an uncontrolled pilot trial of a new brief intervention. We measured BPD traits, beliefs about emotion, treatment preference and cognitive reappraisal and rumination. After engaging with the VR game, measures were reassessed 2-4 weeks later.

Results: Adolescents with higher levels of BPD traits were found to be more likely to endorse a fixed mindset of emotions and were more likely to report higher levels of rumination and lower levels of cognitive reappraisal. Adolescents showed an increase in the belief that their emotions were changeable after a one-time message delivered via VR.

Conclusions: The novel findings suggest implicit theories of emotions may have an important role to play in the aetiology and subsequent treatment of BPD difficulties in adolescents. The study has highlighted the potential benefits of VR for psychoeducational purposes in this population.

Keywords: Borderline Personality, Adolescents, Rumination, Cognitive Reappraisal, Implicit Theories

Introduction

A diagnosis of Borderline Personality Disorder (BPD; American Psychiatric Association, 2013) or Emotionally Unstable Personality Disorder (EUPD; World Health Organisation, 2018) in adolescence remains a controversial topic. This may be due to the stigmatising nature of the label from the self and others (Aviram et al., 2006; Rusch et al., 2006) or the notion that identity formation is incomplete during this stage of life (Shapiro, 1990). Research however, suggests that features or traits of BPD manifest during adolescence or young adulthood (Cohen, Crawford, Johnson, & Kasen, 2005). Henceforth we will refer to the concept of BPD under investigation as BPD traits, to reflect the features of this term rather than a distinct diagnosis. For many adolescents who later in life attract a label of personality disorder, their treatment journey may involve receiving many labels such as Attention Deficit Hyperactivity Disorder (ADHD) and Adjustment Disorder. The majority of young adults with a range of mental health difficulties first received any diagnosis in adolescence (Copeland, Shanahan, Costello, & Angold, 2009; Kim-Cohen et al., 2003), which suggests that understanding the factors that are related to BPD traits in adolescence may inform the development of early interventions most appropriate for this population.

There is currently no gold standard measure for BPD traits in adolescence. The Borderline Personality Features Scale for Children (BPFS-C; Crick, Murray-Close, & Woods, 2005) is based on the Personality and Assessment inventory (PAI; Morey, 2007) for adults, which captures criteria identified for BPD in the Diagnostic and Statistical Manual (DSM). The DSM-fifth edition (American Psychiatric Association, 2013) is one of the main diagnostic tools for BPD, which defines BPD as a difficulty characterised by a pervasive pattern of instability in affect, interpersonal relationships and impulsivity. Adults can receive a diagnosis if they meet at least five of the nine criteria outlined in the DSM5 for at least two years, whereas symptoms in adolescence need only be present for at least one year. The most recent version of the International Classification of Diseases (ICD-11; World Health Organisation, 2018), which will not come into operation until 2022, has reclassified all

personality disorder diagnoses on a continuum-based approach: mild, moderate and severe. Unlike the DSM5, the ICD-11 has redefined BPD based on impairment in personality functioning and has no specified minimum age for diagnosis. Despite these changes, BPD continues to be a term used in clinical practice. For the current study, the term has been used as an overarching definition for the group of difficulties most often experienced by people with a diagnosis of BPD.

People meeting the threshold for BPD can experience extreme emotional reactions and a prolonged return to a baseline affective state compared to people without BPD (Hazlett et al., 2013). Since people with BPD experience turbulent relationships and they also act on impulse much of the time, these emotional swings could be more frequent. The relationships of people with BPD are marked by repeated arguments and breakups and highly emotional or unpredictable responses, including aggressive behaviour (Newhill et al., 2009; Sansone & Sansone, 2012; Scott et al., 2014). People's impulsivity, as related to BPD traits, may manifest in physically self-destructive behaviours, such as suicide attempts or non-suicidal self-injury (NSSI), substance use, under or over eating and reckless driving (Lieb et al., 2004).

Adolescence, itself, is marked by interpersonal difficulties, affective instability and impulsivity, including risk-taking behaviours. For most individuals these traits do not impact on functioning or cause significant levels of distress (Larrivée, 2013). For some people however, these traits can be associated with a poor quality of life, as well as reduced academic and occupational functioning (Feenstra et al., 2012; Winograd, Cohen, & Chen, 2008). Findings indicate prevalence rates of BPD traits of 1.4% - 3.2% amongst children and adolescents (Johnson, Cohen, Kasen, Skodol, & Oldham, 2008; Zanarini et al., 2011), as compared to an adult prevalence of 0.7% (Coid, Yang, Tyrer, Roberts, & Ullrich, 2006; Trull, Jahng, Tomko, Wood, & Sher, 2010). Differences in prevalence rates between adolescents and adults may be related to biopsychosocial factors that are prominent at the adolescent stage of development, as opposed to a pervasive personality deficit. Adolescence therefore

appears to be a crucial stage for early intervention aiming to understand these factors and reduce chronicity, improve outcomes and prevent stigmatising labels in later life (Heary, Hennessy, Swords, & Corrigan, 2017; McGorry, 2013). To target intervention appropriately, we need an understanding of how particular psychological difficulties emerge. This study aims to explore how young people's beliefs about emotions are associated with BPD traits and types of cognitive emotion regulation strategies used when people with these traits become distressed.

Emotional dysregulation is thought to underlie the instability in identity, relationships and behaviour that is experienced by people with BPD (Linehan, 1993). Emotional dysregulation is a complex construct and has been defined as the inability to flexibly respond to and manage emotions (Carpenter & Trull, 2013). The difficulties in emotion dysregulation emerge due to an interaction between personal (i.e. biological or innate) factors and specific environmental influences, as suggested by biosocial theory (Linehan, 1993), which has been used to explain the emergence of BPD traits. The individual is thought to be predisposed to emotional hypersensitivity; in other words, in response to emotionally salient events, arousal increases quickly with a slow return to baseline. It is this emotional sensitivity, in combination with an environment that invalidates the person's emotional expression that leads to the person experiencing instability in their own identity, relationships and behaviours that are characteristic of BPD. Specifically, any harmful behaviours that the person engages in, such as NSSI, are considered to be attempts at self-regulation albeit dysfunctional. The Emotional Cascade model (Selby et al., 2008) extends Linehan's theory to explain how these dysregulated behaviour patterns arise via rumination, which is a maladaptive form of self-focused, repetitive and passive thinking about symptoms of distress, and their causes and consequences (Baer & Sauer, 2011).

When people become increasingly distressed, they often find it more difficult to divert the focus of their attention away from their emotions. This feeds into becoming more upset, thus leading to a positive feedback loop. Rumination thus begets negative affect in a

reciprocal loop (Moberly & Watkins, 2008). This is described in the Emotional Cascade model which states that negative affect results from rumination over an emotionally salient event; this results in an "emotional cascade" (Selby & Joiner, 2013, p. 169). People who engage in rumination are found to experience more severe negative emotions and the experience becomes magnified over time (Thomsen, 2006). However, people may continue to use this strategy because they believe that doing so will further their understanding of the topic or problem at hand and will help them to find a solution (Papageorgiou & Wells, 2001). Paradoxically, this does not happen for them and the person may then view rumination as problematic and subsequently attempt counterproductive thought control strategies, such as suppression of the ruminative thoughts. This is referred to as Ironic process, the irony being that attempts at suppression often leads to the opposite of what the person is trying to achieve (i.e. more rumination (Wegner, 1994)).

Rumination may result in the maladaptive behaviours that people with BPD evince. People may engage in dysregulated behaviours, such as NSSI or binge eating, to serve as distraction from rumination by shifting their focus to the physical sensations. This could be an effective distraction in the short term but results in the presence of a range of behaviours that can become problematic for the person in the long term (Selby et al., 2009). Although this identifies rumination as a key component for changing the patterns associated with distress in BPD, it does not explain what leads to people to use rumination over other cognitive emotion regulation strategies.

Rumination, as one emotion regulation strategy remains the most well-researched topic in general. It is a multi-faceted cognitive strategy that may at times be helpful; for example, reflecting on a negative event such as a life changing health condition, may facilitate a person's adjustment to it. Higher levels of rumination however are generally considered to be maladaptive and has been implicated in the exacerbation and maintenance of a variety of mental health difficulties, including depression (Nolen-Hoeksema, Morrow & Fredrickson, 1993) and post-traumatic stress disorder (Michael, Halligan, Clark & Ehlers,

2007). Whilst some research studies report an association between BPD and increased use of thought suppression (Cheavens et al., 2005) and self-blame (Law & Chapman, 2015), rumination has been connected to BPD across a range of studies (Abela, Payne, & Moussaly, 2003; Baer & Sauer, 2011; Selby, Anestis, Bender, & Joiner Jr., 2009; Smith, Grandin, Alloy, & Abramson, 2006). In particular, rumination on sadness, stress and anger has been linked to affective instability, which may fuel the intense and changeable (often dysphoric) moods of people with BPD (Peters et al., 2017). Rumination has also been associated with the destructive behaviours that people with BPD show, such as NSSI (Armey & Crowther, 2008), bulimic behaviours, suicide attempts (Selby et al., 2008) and substance use (Nolen-Hoeksema, Stice, Wade & Bohon, 2007). These so called 'dysregulated behaviours' (Selby et al., 2008) are difficult to control and can lead to harm or impairment in a person's daily and interpersonal functioning.

People with BPD have been found to engage in cognitive reappraisal less frequently, although this strategy may reduce the emotional lability that people with BPD experience (Lang et al., 2012; Schulze et al., 2010). People who use cognitive reappraisal interpret events in ways that can then reduce the negative impact of the emotional response (Giuliani & Gross, 2009; Gross & Thompson, 2007) and has been shown to be a protective factor from psychopathology (Troy, Wilhelm, Shallcross, & Mauss, 2010). There is limited research on the longitudinal development of cognitive emotion regulation strategies, but initial findings indicate a strong linear increase in the use of cognitive strategies (Mcrae et al., 2012). Adolescence therefore may be a crucial period for intervention to reduce use of rumination and promote helpful strategies such as cognitive reappraisal that support positive wellbeing. What leads adolescents to show preference for one strategy over another remains unclear.

People's beliefs about emotions may be a factor that plays a role in how they respond to negative affect. People fall along a continuum of how they view controllability of emotions (Tamir, John, Srivastava, & Gross, 2007). At one end, people have a changeable belief about emotions, and believe emotions are dynamic and can be changed through

effort. At the other extreme is a fixed belief of emotion, where people believe emotions cannot be changed once they occur. These ways of thinking are described as implicit theories (Hong, Chiu, Dweck, Lin, & Wan, 1999) . They are beliefs that a person has about the inherent malleability of certain traits or abilities. These beliefs were originally studied in educational contexts, and in relation to beliefs about intelligence as either fixed or malleable (Dweck & Leggett, 1988; Hong, Chiu, Dweck, Lin, & Wan, 1999). Recent research has applied implicit theories to emotions (De Castella, Platow, Tamir, & Gross, 2018; Kneeland, Dovidio, Joormann, & Clark, 2016; Tamir et al., 2007). These beliefs may explain why adolescents may be more likely to use the helpful cognitive emotion regulation strategies, such as cognitive reappraisal, when one believes emotions are malleable or the unhelpful emotion regulation strategies, such as rumination when one believes emotions are fixed.

Whether people lean towards a fixed or changeable theory of emotion leads to significant implications for emotion regulation tendencies. Initial research into implicit theories of intelligence found that people who endorsed a fixed belief understood that changes cannot be made through exerting additional effort and subsequently used poorer coping strategies (Doron, Stephan, Boiché, & Le Scanff, 2009). In the context of emotions, people who viewed emotions as fixed failed to regulate their behaviours in anticipation of emotionally salient situations (Tamir et al., 2007). These people were more likely to use avoidance strategies (Shallcross, Troy, Boland, & Mauss, 2010) and cognitive emotion regulation strategies that are considered unhelpful (e.g. rumination (Kneeland, Nolen-Hoeksema, Dovidio, & Gruber, 2016)). Conversely, those who viewed emotions as malleable tended to use strategies that are considered adaptive in many settings (e.g. cognitive reappraisal (De Castella et al., 2013; Tamir et al., 2007)). Furthermore, beliefs about the control of one's own emotions were more significantly related to the types of emotion regulation strategies adopted (De Castella et al., 2013).

To our knowledge, research to date has not examined implicit theories within an adolescent clinical population, although adolescents experience challenges in controlling

their emotions and particularly if they also show BPD traits. The current study, therefore, aims to expand these findings to beliefs about emotions within adolescents who vary on BPD traits. Prior research shows that psychiatric inpatient populations show varying levels of BPD traits (Zanarini et al., 2017). Therefore, this research was conducted in an adolescent inpatient setting.

For adults with a diagnosis of BPD, treatment dropout (Barnicot, Katsakou, Marougka, & Priebe, 2011) and treatment outcome (Barnicot et al., 2012) are extremely varied. Whilst the reasons for this remain unclear, finding ways to involve young people in treatment is key for early intervention. Virtual reality (VR) is an innovative tool to enhance how we assess and treat mental health difficulties. VR involves the simulation of real-world experiences using computer graphics in which the user is immersed into and interacts with the virtual environment. It has been used in the treatment of specific phobias (Botella, Osma, Quero, & Baños, 2004), social anxiety (Anderson et al., 2013) and post-traumatic stress (Fuggetta, Rizzo, Pobric, Lavidor, & Walsh, 2009), as well as to enhance psychoeducation amongst people with autism (Bekele et al., 2014) and bipolar diagnoses (Bernhard et al., 2006). VR has been supported as a safe and well tolerated tool (Rus-Calafell, Garety, Sason, Craig, & Valmaggia, 2018), as well as useful for enhancing motivation towards the treatment (Park et al., 2011). Previous research has suggested measuring the level of engagement in VR during treatment protocols, to determine which individuals are aided by the approach (Reger et al., 2019).

To our knowledge, only one case study has used VR in the context of BPD. VR was used to successfully enhance mindfulness skills across more than one session and subsequently reduce urges to engage in self-destructive behaviours (Nararro-Haro et al., 2016). No study to date has explored the use of VR for BPD within adolescent inpatient mental health services. Single-session interventions that promote a changeable belief of personality have shown to be effective in reducing risk factors for youth internalising disorders (Schleider & Weisz, 2017). The present study aims to explore the use of a single-

session VR game as a platform for delivering a psychoeducational message on the changeability of emotions in inpatient settings.

In the present study, our aims were fourfold, and we tested the following hypotheses. First, we hypothesised that adolescents who endorsed more fixed beliefs of emotion would be more likely to report engaging in unhelpful cognitive emotion regulation strategies, such as rumination as compared to those who reported believing in more changeable emotions. We also hypothesised that they would be less likely to report engaging in more helpful antecedent cognitive emotion regulation strategies, such as cognitive reappraisal. Second, we hypothesised that those with higher BPD traits would report more fixed beliefs than changeable beliefs, given the associated cognitive and behavioural difficulties that those adolescents experience. Third, we hypothesised that if adolescents who hold a more fixed belief of emotion would be less motivated to engage in psychological therapies, since they might not believe that changing emotions is within their control.

Fourth, we hypothesised that adolescents would be more likely to report adopting cognitive reappraisal rather than rumination after receiving a message promoting the changeability of emotion through a virtual reality (VR) game. We tested the strategies used pre- and post-game with approximately two weeks apart.

Method

Participants

The current study was an uncontrolled pilot trial of a new brief intervention. A total of 47 adolescents were approached for consent. Of those approached, 11 declined to participate in the study, one withdrew consent and five were not included because they met the study's exclusion criteria (Appendix 16). Exclusion criteria were a diagnosis of learning disability, current substance misuse or current episode of psychosis. Participants were included if they were aged between 13 and 17 years, were residing in an inpatient in an adolescent mental health unit and were able to understand written and verbal English.

In total, 30 participants were included in the final sample; 19 (63%) completed both parts of the study. At Time 1, the sample contained 20 (67%) females and 1 (3%) participant who identified as transgender male, with a self-reported ethnic distribution of Caucasian (83%), mixed race (7%), Asian (3%) and undisclosed (7%). The average age of the sample was 15.9 years (SD = 1.2, range 14 – 17 years). Whilst in the unit, five (17%) of the young people were being treated with medication only, six (21%) with psychological therapy only, 16 (55%) with a combination of medication and psychological therapy and two (7%) with no treatment at time of participation.

Reasons for being lost to follow-up at Time 2 were participants declining to participate (*n=5*) or because of discharge from the unit (*n=6*). At Time 2, the sample contained 12 (63%) females and one (5%) participant who identified as transgender male, with a self-reported ethnic distribution of Caucasian (79%), mixed race (16%) and undisclosed (5%). The average age of the sample was 15.7 years (SD = 1.3, range 14 – 17 years). Independent t-tests indicated that there were no differences in attrition based on age, gender, ethnicity, BPD traits or other key variables.

Procedure

Ethical approval was gained from the University of Liverpool Research Review Committee (Appendix 5) and National health Service (NHS) Research Ethics Committee (Appendix 7 and 8). A number of candidate sites (regional inpatient Child and Adolescent Mental Health services (CAMHS)) were contacted to participate in the study. Invitations to participate were sent to all people admitted to Tier 4 CAMHS at two NHS Trusts (based in the North West of England), which serve adolescents aged 13 – 17 years. An attempt was made at total sampling recruitment such that all young people who met the criteria were invited to participate by staff. We communicated that the study's purpose was to understand young people's beliefs about emotions and what they do to manage emotions. "Borderline Personality" was not used in any of the materials. All adolescents in the above sites were provided with an information sheet and completed a consent form (Appendix 11) to participate voluntarily in the study. For those under 16 years of age, parents or guardians provided consent (Appendix 10) and the young person provided assent.

Participation consisted of the completion of a brief demographic sheet (Appendix 12) and a set of four self-report measures (Appendix 13), which consisted of Borderline Personality Features Scale for Children (BPFS; Crick, Murray-Close, & Woods, 2005), Implicit Theories of Emotion (De Castella et al., 2013; Tamir et al., 2007), Cognitive Emotion Regulation Questionnaire (ERQA; Garnefski, Kraaij, & Spinhoven, 2002) and hypothetical treatment choice (Schroder, Dawood, Yalch, Donnellan, & Moser, 2015). The young people were verbally presented with a vignette that gave instructions for a VR game, whilst promoting the changeability of emotions (Appendix 14). Their task was to 'fire' at any red neurons, which indicated the fictitious character Joe was experiencing an intense emotion. By firing, they were helping Joe to do things differently, and thus reduce the intensity of his emotions. Following the VR game, participants completed a self-report questionnaire relating to their gaming experience. After a minimum of two-weeks all participants were invited to complete the questionnaires a second time, with the option of playing the VR game after

completion of the second set of questionnaires if they chose, as an incentive for participating. This time frame was selected so that there was sufficient time for participants to update their beliefs and strategies following the VR game. The average gap between Time 1 and Time 2 was 19.42 days (SD= 7.14; range 14-31 days). If they had been discharged within this time, and had consented, they were contacted by post or telephone to complete questionnaires. All participants were provided with £3 vouchers as gratitude for their time.

Measures

Borderline Personality traits: Borderline Personality features scale for children (BPFS-C; Crick et al., 2005).

The BPFS-C is a 24-item self-report assessment of borderline personality traits in children and adolescents aged 9 years and older. We referred to this measure as “How do I feel about myself and others?” for young people. The measure was based upon the BOR (borderline) scale of the Personality and Assessment Inventory (PAI; Morey, 2007) and includes items assessing four main subscales: affective instability, identity problems, negative relationships and self-harm. Participants rated each item using a 5-point Likert scale ranging from 1 (not at all true) to 5 (always true). Items 1, 5, 23 and 24 were reverse scored. Previous research has demonstrated this measure as having good internal consistency (Sharp, Mosko, Chang, & Ha, 2011), good construct validity (Crick et al., 2005), criterion validity (Chang, Sharp, & Ha, 2011) and modest concordance with other reporters (i.e. parents; Chang et al., 2011; Sharp et al., 2011).

There was good internal consistency for total BPFS-C in the current sample (Time 1 $\alpha = 0.791$; Time 2 $\alpha = 0.799$). Consistent with previous research (Chang et al., 2011), the individual subscales were low in consistency, except for the self-harm subscale (Time 1 $\alpha = 0.744$; Time 2 $\alpha = 0.821$).

Beliefs about emotions: Implicit theories of emotion (De Castella et al., 2013; Tamir et al., 2007).

General beliefs about the changeability of emotions were assessed using the 4-item Implicit Beliefs about Emotion Scale (Tamir et al., 2007). The participants' beliefs about the changeability of their own emotions was assessed using a modified version of the original (De Castella et al., 2013). Each measure consists of two fixed belief statements and two changeable belief statements. On each measure, participants rate the degree to which they agree or disagree with each of the four statements on a 5-point Likert scale. Changeable belief items were reverse scored, and the mean score was obtained, with higher scores indicating a fixed belief and lower scores a changeable belief of emotion.

Previous research indicates good internal consistency with both measures (α = .75, Tamir et al., 2007; α = .79; De Castella et al., 2013), which is consistent with the current study for general beliefs about emotion (Time 1 α = 0.785; Time 2 α = 0.645) and beliefs about one's own emotions (Time 1 α = 0.874; Time 2 α = 0.817).

Cognitive emotion regulation strategies: Cognitive Emotion Regulation Questionnaire (CERQ; Garnefski, Kraaij, & Spinhoven, 2002).

The use of cognitive emotion regulation strategies in response to a stressful life event was measured using the CERQ, which was developed for use with adults and adolescents ages 12 years and over. The 36-item questionnaire consists of 9 subscales: self-blame, other-blame, acceptance, planning, positive refocusing, rumination, positive reappraisal, putting into perspective and catastrophising. Each subscale has four items measured on a 5-point Likert scale, ranging from 1 (almost never) to 5 (almost always).

Research indicates the CERQ to have good factorial validity and high reliabilities, with Cronbach's Alphas ranging between .75 and .87 (Garnefski & Kraaij, 2007).

Internal consistency in the current sample was good for the individual subscales, ranging from α = 0.637 to α = 0.882 at Time 1, and from α = 0.606 to α = 0.895 at Time 2. A full list of the internal reliabilities for the subscales are shown in Appendix 15.

Hypothetical treatment choice (Schroder et al., 2015).

Hypothetical treatment choice was measured using one item adapted from (Schroder et al., 2015): “If you struggle, or were to struggle with emotional difficulties (e.g. uncontrollable outbursts of anger, intense sadness) and had a choice between some form of psychological intervention, medication, a combination of medication and psychological intervention or no treatment other than standard monitoring to help you with these difficulties, which would you choose?” This item was to determine the pre-existing preferences for medication or psychological therapy. Further information was given about what each treatment option would entail, and opportunity was provided for participants to ask the researcher.

Flow short scale (Rheinberg, Vollmeyer, & Engeser, 2003).

This 10-item self-report scale measures the components of the flow experience in relation to immersive environments such as VR. Flow is the concept of an immersive experience in which the individual feels in control of their actions (Engeser & Rheinberg, 2008). Participants rate their agreement of items on a Likert scale from 1 (not at all) to 7 (very much), which consists of 2 subscales: fluency in action (6 items) and being absorbed by action (4 items). Used in a variety of contexts (Schüler, 2007; Weibel & Wissmath, 2011), both fluency in action and being absorbed by action subscales show good internal consistency (α = .93 and α = .78 respectively) (Engeser & Rheinberg, 2008).

Internal consistency for total flow in the current sample was good for Time 1 (α = 0.777) and Time 2 (α = 0.706).

Materials

The VR game ran on a Blade Pro-17.3” (full HD) laptop, with Core i7-7700HQ Processor with Hyper-Threading 2.8GHz, a graphic card NVIDIA GeForce GTX 1060 (6GB GDDR5 VRAM) and Windows 10 Home operating system. The immersive virtual environment was displayed on an Oculus Rift VR HMD DK2 system. The Oculus head mounted display provides an immersive 3D virtual environment in a wide field of view.

The InMind version 1 VR game was designed by Nival (2015) and was played on Steam. Total game length was approximately 4 minutes. Participants were briefed on how to play the game (Appendix 14). Participants were verbally introduced to a character who struggled with intense emotions but had recently discovered research findings that supported the notion that emotions are changeable (Appendix 14). The researcher explained that the participant should look at any neurons glowing red for approximately two seconds. Looking at it for this amount of time essentially “fired” a laser to transform the affected neuron from red to green, indicating a reduction in the emotional intensity. Firing and changing the colour was explained as the participant helping the character in the vignette to do something differently to reduce the intensity of negative emotions.

Results

Data Analyses

Results from the G*Power calculations (Faul, Erdfelder, Lang, & Buchner, 2007) for paired sample t-tests, assuming a *p* value = 0.05, a large effect size of 0.5, with a statistical power of 0.8, recommend a sample size of 27. No missing values were detected; however, one participant was excluded from analysis because they did not complete the VR game. This reduced the sample size at Time 1 to 29, and to 18 at Time 2. Prior to analysis, all variables were examined for missing values and distributional assumptions of multivariate analysis.

Sample Description

Full details about skewness and kurtosis are provided in Table 1. The z-scores for skewness and kurtosis indicated that only positive reappraisal at Time 1 had significant skewness and kurtosis, based on a z-score of larger than 1.96 for a sample size of less than 50 (Kim, 2013). Additionally, the outlier was more than 3 standard deviations from the mean. To preserve the data for this participant, the outlier was readjusted to one score above the next highest for this subscale. Adjusting the data accordingly removed significant skewness and kurtosis.

The descriptive statistics for all variables are presented for the total sample in Table 1, and non-parametric correlations are shown in Table 2. Consistent with previous work on implicit theories (De Castella et al., 2013; Tamir et al., 2007) beliefs about emotions were not significantly associated to gender, age or ethnicity. Therefore, these variables are not considered further.

In the current study at Time 1, the average score for total flow (M = 48.03, SD = 11.20, range = 28 – 70) was consistent with previous studies using the measure in community samples who reported a mean of 48.88 (SD = 10.90; Bian et al., 2016). The fluency subscale has an average score for this current sample of 4.873 (SD = 1.365, range =

2.33 – 7), which is higher than the mid-point and average scores observed in other studies (M = 3.57, SD = .68; Sheldon, Prentice & Halusic, 2014).

At Time 1, a total of 3 participants (10.3%) indicated that they would prefer psychological therapies as a treatment option, 5 participants (17.2%) selected the medication only option, 17 participants (58.6%) opted for a combination of psychological therapies and medication, and 4 participants (13.8%) selected the 'no treatment' option. At Time 2, only 1 participant (6%) opted for psychological therapies as a treatment option, 3 (17%) opted for medication, 12 (67%) opted for a combination of psychological therapies and medication. A total of 2 (11%) participants indicated a preference for no treatment at Time 2.

Table 1 *Descriptive statistics for primary study variables at Time 1 and Time 2*

	Time 1 (n=29)				Time 2 (n=18)			
	Cronbach's α	Mean (SD)	Skewness	Kurtosis	Cronbach's α	Mean (SD)	Skewness	Kurtosis
Rumination	0.884	3.534 (0.293)	-0.43	-0.97	0.695	3.597 (0.083)	-0.64	-0.37
Cognitive reappraisal	0.808	2.103 (0.241)	1.08	2.08	0.864	2.292 (0.254)	0.50	-0.70
BPFS	0.794	3.478 (0.403)	-0.51	0.20	0.798	3.382 (0.409)	-0.77	-0.28
Implicit Theories - self	0.875	3.560 (00.325)	-0.11	-0.71	0.821	3.431 (0.404)	-0.47	-1.30
Implicit Theories – General	0.798	3.190 (0.215)	-0.15	0.31	0.645	3.014 (0.233)	-0.33	-1.64
Flow – fluency	0.811	4.874 (0.566)	-0.08	-1.29	0.655	4.630 (0.639)	0.50	-1.12
Flow – absorption	0.270	4.698 (0.174)	-0.32	-0.14	-0.274	4.583 (0.962)	0.94	2.05
Flow- Total	0.777	4.803 (0.443)	0.13	-1.17	0.706	4.611 (0.732)	0.65	-0.57

Association of variables

To test if people who held a more fixed rather than changeable belief of emotion were more likely to use more rumination and less cognitive reappraisal, we conducted a non-

parametric Spearman's Rho correlation. Table 2 shows the non-parametric zero-order correlations among the measures. We looked at cross-sectional correlations within Time 1 and Time 2 to observe if there is any change in the association between implicit theories of emotion and cognitive emotion regulation strategies. The association between general implicit theories of emotion and cognitive reappraisal or rumination were weak and failed to reach significance.

Similarly, to test if people who held a more fixed belief of their own emotion were more likely to use more rumination and less cognitive reappraisal, we conducted a Spearman's Rho correlation. Consistent with predictions, a more fixed belief of one's own emotions was associated with higher levels of rumination at Time 1 (r_s = 0.38, p = 0.042), however, this did not hold at Time 2 (r_s = 0.37, p = 0.133). Cognitive reappraisal on the other hand, showed strong and negative significant correlations with implicit theories of one's own emotions at Time 1 (r_s = -0.72, p = 0.01) and a moderate positive association at Time 2 (r_s = 0.59, p = 0.01). Therefore, if adolescents considered their own emotions to be more fixed than changeable, they reported using less cognitive reappraisal during a negative experience.

To test the hypothesis that people with higher BPD traits would have higher fixed beliefs of emotion, we conducted Spearman's Rank (Rho) correlation coefficients. The correlation between BPD traits and general implicit theories of emotion were weak and non-significant at Time 1 (r_s = 0.11, p = 0.577) and Time 2 (r_s = 0.14, p = 0.595). These weak correlations that fail to reach significance suggest that what adolescents believe about the changeability of emotions in general does not impact on their own mental health. A more fixed belief of one's own emotions, however, was associated with higher BPD traits (Time 1: r_s = 0.44, p = 0.018; Time 2: r_s = 0.58, p = 0.012). This moderate association suggests that adolescents with higher BPD traits also have a more fixed belief about their own emotion but not emotions in general.

Table 2 *Spearman correlations between variables of interest at Time 1 and Time 2*

	1	2	3	4	5	6	7
1.BPD Traits	0.696*	0.164	0.580*	-0.054	0.189	-0.172	0.339
2.Implicit Theories - General	0.233	0.621*	0.042	-0.101	0.007	0.264	-0.196
3.Implicit Theories - self	0.435*	0.453*	0.837*	-0.593*	0.364	-0.177	0.156
4.Cognitive reappraisal	-0.477*	-0.262	-0.724*	0.810*	-0.596*	0.106	0.071
5.Rumination	0.354	-0.029	0.381*	-0.384*	0.715*	-0.071	0.113
6.Age	0.098	0.214	-0.221	0.084	-0.175	-	-
7.Gender	0.235	-0.149	0.011	-0.184	0.066	-	-

**p<.05*
Correlation coefficients for Time 1 are below the diagonal and Time 2 are above the diagonal, with consistency (correlations with the same measure over time) in variables reported on the diagonal

Hypothetical treatment choice

Owing to the small sample size, we were unable to statistically test if there were differences in implicit theories of one's own emotions across the four treatment groups. The McNemar-Bowker test was used to detect if adolescents changed their response for treatment preference following the intervention. As the treatment preference was based on four responses, the McNemar-Bowker test was used because it extends on the McNemar test for symmetry for tables with more than two categories (Bowker, 1948). The McNemar-Bowker test was marginally statistically significant (χ^2 = 14, *df* = 7, *p* = 0.051) suggesting a significant change in treatment preferences from Time 1 to Time 2. We were unable to determine if there is a significant change in frequency of preferences per group due to the low sample size. There is also insufficient power to assess whether the adolescents who changed their mind on treatment choice at Time 2 also changed in implicit theories of emotions.

Change in beliefs about emotion

To test if adolescents would be more likely to adopt healthy cognitive emotion regulation strategies (i.e. cognitive reappraisal) rather than a more unhelpful strategy such as rumination after the VR game, we compared scores on the key variables before and after

the intervention using a paired samples t-test. Results are shown in Table 3. Effects were small and did not reach significance for changes between the two time points for implicit theories about emotions in general, BPD traits, rumination and cognitive reappraisal. There was a significant difference in beliefs about the changeability of one's own emotions from Time 1 to Time 2 (t (17) = 3.31, p = 0.004, d = 0.78), which suggests an increase in beliefs about the changeability of emotions. Although any change in cognitive reappraisal scores did not reach significance, the effect size (d=-0.391) indicates a weak to moderate effect.

Table 3 *Descriptive statistics for key variables and analysis of change from Time 1 to Time 2*

	Mean (SD)		Paired sample t-test			
Variable	Time 1	Time 2	t	df	p	d
Implicit Theories -self	3.560 (0.965)	3.431 (0.835)	3.305	17	0.004	0.779
Implicit Theories - General	3.190 (0.850)	3.014 (0.597)	1.578	17	0.133	0.372
BPD Traits	83.483 (11.627)	81.167 (11.873)	0.21	17	0.836	0.05
Rumination	14.138 (4.711)	14.389 (3.381)	0.357	17	0.726	0.084
Cognitive reappraisal	8.276 (2.987)	9.167 (4.033)	-1.661	17	0.115	-0.391

Discussion

The current study examined how adolescents' belief about the malleability of emotions is associated with BPD traits and cognitive emotion regulation strategies, and whether these beliefs could be changed with a novel brief VR intervention. This study has contributed to the current literature on implicit theories of emotion and mental health, particularly in the context of BPD traits in adolescents. First, people with more fixed beliefs about emotions reported more rumination and less cognitive reappraisal. Further, BPD traits were found to be significantly associated with implicit theories about one's own emotions. Specifically, if adolescents had higher levels of BPD traits, they were also more likely to believe that it is not possible to gain some control over their own emotions. Finally, these beliefs about one's own emotions being changeable increased over time after a one-time message through an active VR experience during which adolescents took control of emotions. Previous literature on implicit theories of emotion suggests links with mental health and emotion regulation strategies in adults (De Castella et al., 2013; Tamir et al., 2007), but not within an adolescent population in the context of BPD. BPD traits are indicated within the research to onset at an early age, and with key developmental changes in emotion regulation strategies occurring in adolescence, it is a period that may be crucial for early intervention.

The findings regarding BPD traits are novel and have not been tested in adolescent samples. Young people's beliefs about their own emotions are notably more pertinent for BPD traits than their beliefs about emotions in general. This is supported by previous research looking at wellbeing and psychological distress in a community sample (De Castella et al., 2013). Beliefs about the self in relation to others are parallel with research into self-stigma amongst women with BPD (Rusch et al., 2006). In this context, self-stigma refers to the notion that they alone are inadequate and perceived as such from others. Self-stigma is shown to be inversely related to self-efficacy, which determines the effort an individual will expend (Rusch et al., 2006). People with high self-efficacy in a certain domain

display more effort and persistence (Bandura, 1997; Bandura, 2001), which may bear some overlap with the implicit theories literature. Future research could consider applying the implicit theories framework to self-stigma of mental health difficulties, particularly BPD.

Consistent with predictions, the present study showed that adolescents with stronger beliefs in a fixed theory of emotions were more likely to ruminate and less likely to use cognitive reappraisal to regulate their emotions. These results support previous findings amongst community samples (De Castella et al., 2013; Kneeland, Dovidio, et al., 2016; Schroder et al., 2015). This is akin to the learned helplessness theory (Seligman, 1972), which describes the passive behaviour a person may engage in if enduring a repeatedly painful experience that they are unable to escape or avoid. These results support the idea that a person's perceptions of possibility to change one's own attributes may influence the person's use of strategies to change. If a person believes that they have no control or ability to influence the intensity of emotions as they occur, they are more likely to passively dwell on their negative mood.

Our findings have implications for treatment. Focusing on emotion regulation strategies raises the distinct possibility that promoting a changeable mindset may lead to reductions in symptoms. The main purpose of this study was to test if a brief changeable mindset intervention, delivered through a VR platform, reduced the use of rumination and increased the use of cognitive reappraisal in adolescents in a mental health inpatient unit. The results revealed that whilst there was no significant change in use of cognitive emotion regulation strategies between the two points of testing, there was an increase in adolescents endorsing a changeable mindset of emotions. These results are consistent with recent research in which students increasingly favoured a growth mindset of emotion following two 45-minutes intervention sessions (Smith et al., 2018). The current study expanded on these findings by producing a change using a very brief and innovative mode of intervention. The average scores in the measure of flow suggest that adolescents in the current study were engaged in the task presented to them. The fluency subscale of the measure of flow has

been shown to be positively associated with mindfulness (Sheldon, Prentice & Halusic, 2014). As scores on this subscale were higher in the current study than in previous research (Sheldon et al., 2014), this suggests that the intervention delivered in the VR format may have some overlap with mindfulness-based approaches. This has practical clinical implications for the use of such a tool in a range of settings, such as schools or mental health, to explicitly deliver this message efficiently.

Those scoring higher in a fixed belief at baseline were found to benefit from interventions (Smith et al., 2018). Owing to the limited sample size of the current data, it cannot be determined if this pattern could be replicated. To our knowledge, the current study was the first to explore the effects of an intervention for implicit theories of emotion with adolescents in a clinical population. The lack of significant change in cognitive emotion regulation strategies may be attributable to the severity of mental health difficulties and thus how embedded these strategies might be within this population. Another explanation could be due to the participants' meta-cognition about rumination. The Self-Regulatory Executive Function (S-REF) model of rumination (Wells, 2000) accounts for the information processing mechanisms that initiate and maintain rumination and the consequences of this thinking style. The meta-cognitive aspects refer to the facets of the system that monitor, evaluate and regulate content and processes (Wells, 2000). If a person holds positive beliefs about rumination as a beneficial strategy, the thinking style will be maintained. Similarly, if they hold negative beliefs about rumination, they are likely to engage in 'ironic' thought control or suppression strategies, which also maintain such thinking processes. The intervention in the current study explicitly addressed the possibility of change in emotions, which impacted their beliefs in this domain. It did not however, directly challenge their beliefs about the changeability of thinking styles, such as rumination, which may have led to little change in this domain. Further research may hope to explore interventions addressing various domains and the differential impact on a range of outcomes.

Historically, the retention of people with BPD in psychological treatments has been low, and the presence of BPD in clinical samples often predicts high dropout rates (Chiesa, Drahorad, & Longo, 2002). Studies often do not report on treatment engagement. Results from treatment trials indicate that Dialectical Behaviour Therapy (DBT) and psychodynamic approaches are shown to be most effective for BPD, but effect sizes are low (Cristea et al., 2017). For people to initiate attempts to regulate their emotions, they must first believe that emotions can in principle be controlled and most importantly, that they can personally control them (Tamir & Mauss, 2011). The VR intervention, as well as underlining the person's need to do something (i.e. alter their behaviour) to create change (i.e. in their emotion), may also increase their personal efficacy.

Research has established that those with fixed mindsets generally attribute this to genetic and biological causes (Dweck, 2006), thus such people may be more likely to favour medication over psychological therapies. Psychological therapies require a lot of effort and work from the individual to create change and motivation to engage may be influenced by the person's belief in their ability to change. Despite previous research supporting an association between implicit theories and treatment choice (Schroder et al., 2015), the final hypothesis was not supported in the current study. The reasons for this could be due to the inadequate sample size to achieve sufficient power or due to the nature of the clinical population. Clinical populations are likely to have more knowledge about the nature of the treatment options than the general public. It was noted that most of the participants opted for a combination of medication and psychological therapies, which is proportionate to the actual treatments being delivered on the treatment units. Future replications may aim to limit the treatment options to psychological therapies, medication or no treatment.

Prior research has found that changes in people's beliefs about emotions mediate cognitive behavioural therapy (CBT) outcomes and predict treatment gains at 12-month follow-up (Castella et al., 2015) (De Castella et al., 2015). The VR intervention in the current study drew on principles from CBT and may have prepared participants for engagement in

their current treatments. Prochaska & Diclemente (1982) described the five stages of change that people face in altering problematic behaviours. Providing people with the belief that change is possible could place them at the contemplation stage for change. Although the current study did not use any specific measures of motivation to engage in the treatment, the participants were asked what treatment type they would be most likely to opt for. Owing to low sample sizes however, it cannot be determined if there was a significant change in the treatment preferences selected by adolescents.

It would be interesting in future research, to determine if repeated exposure to the brief intervention produces any changes in cognitive strategies, treatment preferences and motivation to engage in treatment for a clinical population over a longer time period. Future research may also benefit from a behavioural measure, which logs the frequency of engagement in a dysregulated behaviour associated with BPD and whether there is a reduction in behaviours between the time points.

Limitations.

The results from this study should be interpreted in light of the following limitations. Firstly, a control condition was not included in which participants either received a message promoting a fixed mindset of emotions or treatment as usual. Naturally, this impedes any conclusions about specific mechanisms by which the intervention exerted its effects, over and above the effect of time. Because of a concern about the ethics of a control group, we decided to allow all young people in the unit to have the opportunity to engage in the intervention that promotes a changeable mindset. Furthermore, the sample population was receiving some form of treatment as part of their inpatient stay, we do not know if the intervention worked or if people changed their implicit theories because of treatment in the facility. For example, interventions received in the unit may influence unhelpful cognitive processes, such as rumination that are associated with depression. However, we could not anticipate that the interventions in the unit would have an effect on implicit theories, as they are not designed to target beliefs about emotion.

The vignette introduced participants to the idea of firing at the character's neurons, which would reduce the intensity of the character's emotional experience. It is not clear from the current study whether this conveyed a message that the character was unable to do this independently. The requirement of a third party could be synonymous with taking medication or requiring a therapist. Further research might wish to allocate some participants to a 'vignette only' condition, where they are given the message of malleability of emotions without the VR game. Furthermore, a mixed methods approach may have provided further qualitative information regarding the feasibility and relevance of the intervention.

A third limitation is the primary use of self-report measures. There are inherent limitations to this modality. The research into implicit theories focuses predominantly on self-report measures, which can be limited in a variety of ways. Self-report relies on a person's understanding or introspective ability, they may be subject to response bias or demand characteristics. Also, comparison with other self-report measures leads to shared method variance which may inflate correlations.

Finally, the small sample size means that some of the statistical analysis may be underpowered. Consequently, any changes between time points may reflect a regression to the mean or alternatively may be a genuine effect. A larger sample size, as well as additional time points, would allow for more informative statistical procedures. Use of such procedures, together with replication of these basic findings, may help elucidate the magnitude and consistency of observed effects. More longitudinal time points would allow for the assessment of bidirectional relations between implicit theories and mental health variables using analysis such as latent growth curve models. Nonetheless, current work provides a foundation for future investigations into implicit theories of emotions in mental health; specifically, beliefs about the changeability of one's own emotions may play an important role in presentation and treatment of BPD difficulties. Future research ought to track the progress of participants longitudinally, to determine if the onset of symptoms precedes the implicit theories.

Conclusion.

Awareness of these limitations, however, should not lead to an underestimation of the importance of the practical implications of the study. Notably for this study, the initial relationships observed between a fixed belief of emotions, BPD traits and cognitive emotion regulation strategies indicates that these beliefs may have an important role to play in the aetiology and subsequent treatment of these difficulties. This research has enabled for a timely integration of phenomena from social and educational psychology in a clinical psychology setting.

The study supported the appropriate use of VR with this population and the potential benefits of brief positive psychoeducational messages using this technology. Furthermore, the intervention used in the current study could help with the acquisition of skills to manage emotions in a non-clinical population. In our experience, employing the use of VR facilitated the recruitment process with adolescents. Although this is not tested empirically, it supports the possibility of also engaging hard-to-reach groups in psychoeducational materials.

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Appendices

Appendix 1: Author Guidelines of the European Journal of Personality

Some basic information about EJP

EJP publishes papers that advance personality science in its broadest sense. We consider all research fields relevant to the understanding of personality (e.g., personality structure, processes, expressions in social context, causes, development, and consequences) and across aspects of personality (e.g., temperament, character, motives and goals, self-concept, identity, life narratives, reputations, interpersonal styles, values, attitudes, stereotypes and prejudice, vocational as well as leisure interests and intelligence as well as other abilities such as creativity or emotional competencies).

EJP welcomes high quality empirical contributions, innovative theoretical and methodological papers as well as systematic reviews and meta-analyses. We also welcome and encourage well-designed preregistered replications of previously published findings that are highly relevant to the field. We do not encourage submissions of papers that are primarily aimed at the psychometric validation of measurement scales. Further, we do not encourage psychopathological approaches with little relevance to the understanding of personality in general.

EJP encourages authors to be as succinct as possible and yet as detailed as necessary to fully explain the background and hypotheses, to completely describe the methods and results, and to thoroughly interpret the findings, in the light of limitations and alternative explanations. EJP has no word limit for manuscripts, but we do encourage authors to use supplementary material for additional details of the materials, data, analyses, and results.

EJP has an increasing reputation as publishing high quality, in-depth contributions to personality science, and a current impact factor of 3.71. EJP is highly selective with a current overall rejection rate of around 88% and a desk-rejection rate of around 55%, and we are committed to constructive, fast and in-depth feedback. The overall average time to first decision is just 20 days and below 40 days for papers sent out to review. Final proof-read articles are published online within a month of the acceptance date and typically appear in a printed issue shortly afterwards.

In these Author Guidelines, we provide information on EJPs evaluation criteria, mandatory transparency standards, information on streamlined review options, our blind review policy, and formal details regarding manuscript preparation, submission, and production. It is also recommended to read the **2017 Editorial** and the **2018 Editorial** for further details and discussion.

If you are planning to submit a Registered Report (i.e., manuscripts that contain a study proposal submitted prior to data collection, see https://cos.io/rr) we ask you to additionally refer to our **Registered Report Author Guidelines**.

Evaluation criteria

Personality psychology is a broad and rich field, and there is, naturally, not just a single recipe for an excellent paper worthy of being published in EJP. In the following, we briefly highlight a number of evaluation criteria for judging the contribution of a submitted paper by action editors. These criteria are also used by reviewers to provide formal ratings in addition to their regular review.

- **Overall Contribution**
  - Importance: Does the paper deal with a key question of personality research, relevant to several research fields within personality psychology and beyond?
  - Novelty: Does the paper address novel questions and provides novel insight? Does it explore important but overlooked phenomena, a creative approach to a topic, new or seldom used designs and methods, or understudied samples?
- **Theoretical background**
  - Conceptual reasoning: Do authors provide a thought-through and well-outlined theoretical reasoning and delineation of hypotheses and/or research questions? Are constructs and research problems well-defined and distinguished from each other?
  - Literature review: Do authors provide a comprehensive and well-integrated overview of previous work relevant to the theoretical rationale and methodological approach?
- **Methodology**
  - Transparency: Does the paper include all necessary information regarding sampling, procedures and measures (e.g., including if necessary supplemental material)?
  - Robustness: Are the results based on sufficiently high statistical power? Does it include cross-cultural, cross-laboratory and/or cross-sample validations of the results?
  - Representativeness: Did the design and measures allow for a good representation of the phenomena of interest? Were participants, as well as stimuli, or situational context features representative samples of the universe of relevant participants, stimuli etc.?
- **Analyses and results**
  - Reporting standards: Are all necessary descriptive information reported (including means, standard deviations, and reliabilities for all measures, as well as zero-order correlations between all measures)? Do the authors report effect sizes, confidence (or credible) intervals, and exact p-values (when they rely on the frequentist inference framework)?
  - Statistical analyses: Are the statistical analyses appropriate and up-to-date? Do the authors include sufficient alternative/supplementary analyses to back-up the robustness of the findings?
  - Multiple testing: Do the authors sufficiently address issues of multiple testing?
  - Careful language: Does the description and interpretation of results reflect the fact that the results cannot be interpreted as ultimate truth (e.g., past tense, non-causal language)?
- **Discussion:**
  - Careful inferences: Is there a good correspondence between data and results and the inferences drawn? Is the writing cautious regarding causality and finality? Are results and effect sizes discussed in an appropriate and context-sensitive way?
  - Theoretical discussion: Do the authors provide a thought-through discussion of the conceptual implications of their work? Does the discussion reflect a careful thinking about mechanisms and causality in how the phenomena are linked? Is there a meaningful integration into previous work and competing theories?

- Limitations section: Is the limitations section thorough? Do the authors show awareness to a restricted statistical power, potential alternative interpretations, and potential methodological confounds? Is there a careful discussion of generalizability? Do authors provide thoughtful and stimulating guidance regarding potential solutions to these limitations in future research?

- **Quality of writing / presentation**
  - Clarity and coherence: Is there a well-organized and consistent structure? Does the manuscript have clear and meaningful subsections and -headings? Is the reasoning and labeling consistent throughout the manuscript?
  - Formal standards: Is the writing correct and concise (spelling, grammar, and style)? Does the manuscript follow APA standards (incl. references, tables, figures, and notes)?

Formal aspects

Manuscript style and submission preparation

The language of the journal is English. The manuscripts should confirm to the most recent publication manual by the *American Psychological Association* (APA). It is not necessary to double-line space your manuscript.

- **Title page**: The title page of the manuscript should only include the title of the paper without any information regarding names or affiliations of authors. In addition to the manuscript file, however, a title page including names and affiliations of all authors should be uploaded as "Title Page". In this additional title page please include the full address, including email, and telephone, of the corresponding author as well as the name(s) of any sponsor(s) of the research contained in the paper, along with grant number(s).
- Include an **abstract** of up to 200 words for all articles. An abstract is a concise summary of the whole paper, including the methods, not just the conclusions, and should be understandable without reference to the rest of the paper. It should contain no citation to other published work.
- Include a minimum of three and up to five **keywords** that describe your paper for indexing purposes.
- **Main text**: EJP manuscripts have no word limit but EJP values succinct writing. Where appropriate, you should use sub-headings to structure the Introduction, Method, Results, and Discussion parts of the manuscript.
- **Tables** should be part of the main document. For initial submissions, tables can be either incorporated into the main text or on separate pages after the reference list. For revised submissions, tables should be on separate pages after the reference list, and not be incorporated into the main text. At his stage, if the table is created as a spreadsheet the file should be uploaded separately.
- **Figures:** For initial submission, figures can be part of the main document and can be either incorporated within the main manuscript or placed at the end of the document. For revised submissions, upload each figure as a separate file in either .tiff or .eps format, with the figure number and the top of the figure indicated.
    - Compound figures e.g. 1a, b, c should be uploaded as one figure.
    - Tints are not acceptable.
    - Lettering must be of a reasonable size that would still be clearly legible upon reduction, and consistent within each figure and set of figures.
    - Where a key to symbols is required, please include this in the artwork itself, not in the figure legend.
    - All illustrations must be supplied at the correct resolution:
        - Black and white and color photos - 300 dpi
        - Graphs, drawings, etc - 800 dpi preferred; 600 dpi minimum
        - Combinations of photos and drawings (black and white and color) - 500 dpi
    - Color Policy. Where color is necessary to the understanding of the figures, color illustrations will be reproduced in the journal without charge to the author.
- If it applies to your study, please ensure that an **ethics statement** is included in the article.
- **Pre-submission English-language editing:** Authors may choose to have their manuscript professionally edited before submission to improve the English. A list of independent suppliers of editing services can be found at http://wileyeditingservices.com/en/. All services are paid for and arranged by the author, and use of one of these services does not guarantee acceptance or preference for publication.

Appendix 2: Author Guidelines of the Journal of Child Psychology and Psychiatry – Empirical paper

General

Contributions from any discipline that further knowledge of the mental health and behaviour of children and adolescents are welcomed. Papers are published in English, but submissions are welcomed from any country. Contributions should be of a standard that merits presentation before an international readership.

Layout
Title: The first page of the manuscript should give the title, name(s) and short address(es) of author(s), and an abbreviated title (for use as a running head) of up to 60 characters.

Abstract
The abstract should not exceed 300 words and should be structured in the following way with bold marked headings: Background; Methods; Results; Conclusions; Keywords; Abbreviations. The abbreviations will apply where authors are using acronyms for tests or abbreviations not in common usage.

Key points and relevance
All papers should include a text box at the end of the manuscript outlining the four or five key (bullet) points of the paper. These should briefly (80-120 words) outline what's known, what's new, and what's relevant.

Under the 'what's relevant' section we ask authors to describe the relevance of their work in one or more of the following domains - policy, clinical practice, educational practice, service development/delivery or recommendations for further science.

Headings
Articles and research reports should be set out in the conventional format: Methods, Results, Discussion and Conclusion. Descriptions of techniques and methods should only be given in detail when they are unfamiliar. There should be no more than three (clearly marked) levels of subheadings used in the text.

Acknowledgements
These should appear at the end of the main text, before the References.

Correspondence to
Full name, address, phone, fax and email details of the corresponding author should appear at the end of the main text, before the References.

References
The *JCPP* follows the text referencing style and reference list style detailed in the *Publication manual of the American Psychological Association* (5th edn.)i.

References in text
References in running text should be quoted as follows:
Smith and Brown (1990), or (Smith, 1990), or (Smith, 1980, 1981a, b), or (Smith & Brown, 1982), or (Brown & Green, 1983; Smith, 1982).

For up to five authors, all surnames should be cited in the first instance, with subsequent occurrences cited as et al., e.g. Smith et al. (1981) or (Smith et al., 1981). For six or more authors, cite only the surname of the first author followed by et al. However, all authors should be listed in the Reference List. Join the names in a multiple author citation in running text by the word ‘and’. In parenthetical material, in tables, and in the References List, join the names by an ampersand (&). References to unpublished material should be avoided.

Reference list
Full references should be given at the end of the article in alphabetical order, and not in footnotes. Double spacing must be used.

References to journals should include the authors' surnames and initials, the year of publication, the full title of the paper, the full name of the journal, the volume number, and inclusive page numbers. Titles of journals must not be abbreviated and should be italicised.

References to books should include the authors' surnames and initials, the year of publication, the full title of the book, the place of publication, and the publisher's name.

References to articles, chapters and symposia contributions should be cited as per the examples below:

Kiernan, C. (1981). Sign language in autistic children. *Journal of Child Psychology and Psychiatry*, *22*, 215-220.

Thompson, A. (1981). *Early experience: The new evidence*. Oxford: Pergamon Press.

Jones, C.C., & Brown, A. (1981). Disorders of perception. In K. Thompson (Ed.), *Problems in early childhood* (pp. 23-84). Oxford: Pergamon Press.

Use Ed.(s) for Editor(s); edn. for edition; p.(pp.) for page(s); Vol. 2 for Volume 2.

Tables and Figures
All Tables and Figures should appear at the end of main text and references, but have their intended position clearly indicated in the manuscript. They should be constructed so as to be intelligible without reference to the text. Any lettering or line work should be able to sustain reduction to the final size of reproduction. Tints and complex shading should be avoided and colour should not be used unless essential. Authors are encouraged to use patterns as opposed to tints in graphs. In case of essential colour figures, authors are reminded that there is a small printing charge. Authors will be contacted during the proofing stage of thier accepted paper. Figures should be originated in a drawing package and saved as TIFF, EPS, or PDF files. Further information about supplying electronic artwork can be found in the Wiley electronic artwork guidelines **here**.

Nomenclature and symbols
Each paper should be consistent within itself as to nomenclature, symbols and units. When referring to drugs, give generic names, not trade names. Greek characters should be clearly indicated.

Supporting Information
Examples of possible supporting material include intervention manuals, statistical analysis syntax, and experimental materials and qualitative transcripts.

Appendix 3: Downs and Black (1998) checklist – Modified Version

Study:		
Criteria	0	1
Study quality		
1. Is the hypothesis/aim/objective of the study clearly described?		
2. Are the main outcomes to be measured clearly described in the Introduction or Methods section? If the main outcomes are first mentioned in the Results section, the question should be answered no.		
3. Are the characteristics of the people included in the study clearly described? In cohort studies and trials, inclusion and/or exclusion criteria should be given. In case-control studies, a case-definition and the source for controls should be given.		
4. Are the main findings of the study clearly described? Simple outcome data (including denominators and numerators) should be reported for all major findings so that the reader can check the major analyses and conclusions. (This question does not cover statistical tests which are considered below).		
5. Does the study provide estimates of the random variability in the data for the main outcomes? In non-normally distributed data, the inter-quartile range of results should be reported. In normally distributed data the standard error, standard deviation or confidence intervals should be reported. If the distribution of the data is not described, it must be assumed that the estimates used were appropriate and the question should be answered yes.		
6a. Have the characteristics of people lost to follow-up been described? (applicable to longitudinal studies only)		
6b. Is the response rate clearly described? (applicable to cross-sectional studies only)		
7. Have actual probability values been reported (e.g.0.035 rather than <0.05) for the main outcomes except where the probability value is less than 0.001?		
External validity All the following criteria attempt to address the representativeness of the findings of the study and whether they may be generalised to the population from which the study subjects were derived.		
8. Were the subjects asked to participate in the study representative of the entire population from which they were recruited? The study must identify the source population for people and describe how the people were selected. People would be representative if they comprised the entire source population, an unselected sample of consecutive people, or a random sample. Random sampling is only feasible where a list of all members of the relevant population exists. Where a study does not report the proportion of the source population from which the people are derived, the question should be answered as unable to determine.		
9. Were those subjects who were prepared to participate representative of the entire population from which they were recruited? The proportion of those asked who agreed should be stated. Validation that the sample was representative would include demonstrating that the distribution of the main confounding factors was the same in the study sample and the source population.		
Internal validity - bias		
10. If any of the results of the study were based on "data dredging", was this made clear? Any analyses that had not been planned at the outset of the study should be clearly indicated. If no retrospective unplanned subgroup analyses were reported, then answer yes		
11. Were the statistical tests used to assess the main outcomes appropriate? The statistical techniques used must be appropriate to the data. For example, nonparametric methods should be used for small sample sizes. Where little statistical analysis has been undertaken but where there is no evidence of bias, the question should be answered yes. If the distribution of the data (normal or not) is not described it must be assumed that the estimates used were appropriate and the question should be answered yes.		
12. Were the main outcome measures used accurate (valid and reliable)? For studies where the outcome measures are clearly described, the question should be answered yes. For studies which refer to other work or that demonstrates the outcome measures are accurate, the question should be answered as yes.		

Internal validity - confounding (selection bias)		
13. Was there adequate adjustment for confounding in the analyses from which the main findings were drawn? This question should be answered no for trials if: the main conclusions of the study were based on analyses of treatment rather than intention to treat; the distribution of known confounders in the different treatment groups was not described; or the distribution of known confounders differed between the treatment groups but was not taken into account in the analyses. In non-randomised studies if the effect of the main confounders was not investigated or confounding was demonstrated but no adjustment was made in the final analyses the question should be answered as no.		
14. were losses of participants to follow-up taken into account? Longitudinal only.		
Power		
15. Did the study have sufficient power to detect a clinically important effect where the probability value for a difference being due to chance is less than 5%? Sample sizes have been calculated to detect a difference of x% and y%.		
Total		

Appendix 4: Quality Assessment Complete Results

	Question														
Study	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Caprara et al. (2017)	1	1	1	1	0	0	0	1	0	1	0	1	1	NA	1
Del Bove, Caprara, Pastorelli, & Paciello (2008)	1	1	1	0	0	0	1	0	0	1	1	1	1	NA	0
Francisco, Loios, & Pedro (2016)	1	1	1	1	0	1	1	0	0	1	0	1	1	NA	0
Garnefski et al. (2005)	1	1	1	1	0	1	0	1	0	1	1	1	1	NA	0
Goodman & Southam-Gerow (2010)	1	1	1	1	1	1	0	1	0	1	1	1	1	NA	0
Harmon et al. (2017b)	1	1	1	1	1	1	0	1	1	1	1	1	1	NA	0
Mathieson, Klimes-Dougan, & Crick (2014)	1	1	1	1	1	1	1	1	0	1	0	1	1	NA	0
Patel, Day, Jones, & Mazefsky (2017)	1	1	0	1	1	1	1	0	0	1	1	0	0	NA	0
Peled & Moretti (2007b)	1	1	1	1	0	0	1	0	1	0	1	0	1	NA	0
Rey Peña & Pacheco (2012)	1	1	1	1	0	0	0	0	0	1	1	1	1	NA	0
Smith et al. (2016; study 1)	1	1	1	1	1	0	0	0	0	0	1	1	1	NA	0
Vasquez, Osman, & Wood (2012)	1	1	0	0	0	0	1	0	0	0	0	0	1	NA	0
Tanner, Hasking, & Martin (2015)	1	1	1	1	1	1	0	1	0	0	1	1	0	NA	0
Burke et al. (2015)	1	1	1	0	0	0	0	0	0	1	0	1	0	NA	0
Tanner, Hasking, & Martin (2014)	1	1	1	1	0	1	0	1	0	0	1	1	0	NA	0
Voon, Hasking, & Martin (2014c)	1	1	0	1	0	0	0	0	0	1	0	1	1	NA	0
Xavier, Cunha, & Pinto-Gouveia (2018)	1	1	1	1	1	0	1	0	0	1	0	1	0	NA	1
Willem, Bijttebier, Claes, & Raes (2011)	1	1	1	1	1	1	0	0	0	1	1	1	1	NA	0
Caprara, Paciello, Gerbino, & Cugini (2007)	1	1	1	0	0	1	0	0	0	0	1	1	1	1	0
McLaughlin, Hatzenbuehler, Mennin, & Nolen-Hoeksema (2011)	1	1	1	0	0	1	1	1	0	1	1	1	0	0	0

McLaughlin, Aldao, Wisco, & Hilt (2014)	1	1	0	1	0	1	1	1	1	1	1	1	1	0	0
Smith et al. (2016; study 2)	1	1	1	0	1	0	1	1	0	1	1	1	1	1	0
Adrian, McCarty, King, McCauley, & Stoep (2014)	1	1	1	1	0	1	0	1	1	1	1	1	1	1	0
Hilt, Armstrong, & Essex (2017)	1	1	1	1	1	0	1	0	0	0	1	1	1	1	0
Skitch & Abela (2008)	1	1	1	1	1	0	0	1	1	1	1	1	1	1	0
Barrocas, Giletta, Hankin, Prinstein, & Abela (2015)	1	1	1	1	1	0	0	1	0	1	1	1	1	1	0
Voon et al. (2014a)	1	1	1	0	1	1	0	1	0	0	1	1	1	1	0
Bjarehed & Lundh (2008)	1	1	1	0	0	0	1	0	0	1	0	1	1	0	0
Holm-Denoma & Hankin (2010)	1	1	1	1	0	0	0	1	1	1	1	1	1	1	0
Auerbach, Kertz, & Gardiner (2012)	1	1	1	0	1	0	0	0	0	0	1	1	0	0	0

Appendix 5: Research Review Committee Final Approval

D.Clin.Psychology Programme
Division of Clinical Psychology
Whelan Building, Quadrangle
Brownlow Hill
LIVERPOOL
L69 3GB

Tel: 0151 794 5530/5534/5877
Fax: 0151 794 5537
www.liv.ac.uk/dclinpsychol

14 August 2017

Jane McLachlan
Clinical Psychology Trainee
Doctorate of Clinical Psychology Doctorate Programme
University of Liverpool
L69 3GB

RE: Borderline personality traits and emotion regulation strategies in adolescents: the role of implicit theories
Trainee: Jane McLachlan
Supervisors: Dr. Luna Centifanti, Dr. Mani Mehdikhani

Dear Jane,

Thank you for your response to the reviewers' comments of your research proposal submitted to the D.Clin.Psychol. Research Review Committee (letter dated 14/08/2017).

I can now confirm that your amended proposal (*version 2, date 1/08/2017*) (*and revised budget, version 1, dated 16/5/2017)* meet the requirements of the committee and have been approved by the Committee Chair.

Please take this Chairs Action decision as ***final*** approval from the committee.

You may now progress to the next stages of your research.

I wish you well with your research project.

Dr Valentina Lorenzetti
Vice-Chair D.Clin.Psychol. Research Review Committee.

Appendix 6: Sponsor Final Approval

Dr Luna Centifanti
Institute of Psychology, Health and Society
Block B Waterhouse Building
Brownlow Street
Liverpool
L69 3GL

Mr Alex Astor
Head of Research Support – Health and Life Sciences

University of Liverpool
Research Support Office
2nd Floor Block D Waterhouse Building
3 Brownlow Street
Liverpool
L69 3GL

Tel: 0151 794 8739
Email: sponsor@liv.ac.uk

17 April 2018

Sponsor Ref: UoL001345

Re: Sponsor Permission to Proceed notification

"Borderline personality traits and emotion regulation strategies in adolescents: The role of implicit theories"

Dear Dr Centifanti

All necessary documentation and regulatory approvals have now been received by the University of Liverpool Research Support Office in its capacity as Sponsor, and we are satisfied that all Clinical Research Governance requirements have been met. You may now proceed with any study specific procedures to open the study.

The following REC Approved documents have been received by the Research Support Office. Only these documents can be used in the recruitment of participants. If any amendments are required please contact the Research Support Office.

Document title	Version	Date
Protocol	3	17/11/17
Questionnaire Pack	2	09/02/18
Information Sheet – Parents and Guardians	2	09/02/18
Information Sheet – Participant	2	09/02/18

Please note, under the terms of your Sponsorship you must;

1. Gain NHS Confirmation of Capacity and Capability/Site Permission from each participating site before recruitment begins at that site;

2. Ensure all required contracts are fully executed before recruitment begins at any site;

3. Inform the Research Support Office as soon as possible of any adverse events especially SUSARs and SAE's, Serious Breaches to protocol or relevant legislation or any concerns regarding research conduct (as per *SOP007)*;

4. Approval must be gained from the Research Support Office for any amendments to, or changes of status in the study **prior to** submission to REC and any other regulatory authorities (as per SOP018);

5. It is a requirement that Annual Progress Reports are sent to the NHS Research Ethics Committee (REC) annually following the date of Favourable Ethical Approval. You must provide copies of any reports submitted to REC and other regulatory authorities to the Research Support Office;

6. Maintain the study master file (as per SOP005);

7. Make available for review any study documentation when requested by the sponsors and regulatory authorities for the purposes of audit or inspection (as per *SOP002*);

8. Upon the completion of the study it is a requirement to submit an End of Study Declaration (within 90 days of the end of the study) and End of Study Report to REC (within 12 months of the end of the study). You must provide copies of this to the Research Support Office;

9. Ensure you and your study team are up to date with the current RSO SOPs throughout the duration of the study.

If you have any queries regarding the sponsorship of the study please do not hesitate to contact the Clinical Research Governance Team on 0151 794 8373 (email sponsor@liv.ac.uk).

Yours sincerely

Mr Alex Astor
Head of Research Support – Health and Life Sciences
Research Support Office

Appendix 7: Letter of HRA Approval

NHS
Health Research Authority

Ms Jane McLachlan
University of Liverpool,
Department of Clinical Psychology, Ground Floor,
Whelan Building
Brownlow Hill
Liverpool
L69 3GB

Email: hra.approval@nhs.net

27 March 2018

Dear Ms McLachlan

Letter of HRA Approval

Study title:	**Borderline Personality traits and emotion regulation strategies in adolescents: The role of implicit theories**
IRAS project ID:	**236830**
REC reference:	**18/NW/0034**
Sponsor	**University of Liverpool**

I am pleased to confirm that **HRA Approval** has been given for the above referenced study, on the basis described in the application form, protocol, supporting documentation and any clarifications noted in this letter.

Participation of NHS Organisations in England

The sponsor should now provide a copy of this letter to all participating NHS organisations in England.

Appendix B provides important information for sponsors and participating NHS organisations in England for arranging and confirming capacity and capability. **Please read *Appendix B* carefully**, in particular the following sections:

- *Participating NHS organisations in England* – this clarifies the types of participating organisations in the study and whether or not all organisations will be undertaking the same activities
- *Confirmation of capacity and capability* - this confirms whether or not each type of participating NHS organisation in England is expected to give formal confirmation of capacity and capability. Where formal confirmation is not expected, the section also provides details on the time limit given to participating organisations to opt out of the study, or request additional time, before their participation is assumed.
- *Allocation of responsibilities and rights are agreed and documented (4.1 of HRA assessment criteria)* - this provides detail on the form of agreement to be used in the study to confirm capacity and capability, where applicable.

Further information on funding, HR processes, and compliance with HRA criteria and standards is also provided.

It is critical that you involve both the research management function (e.g. R&D office) supporting each organisation and the local research team (where there is one) in setting up your study. Contact details and further information about working with the research management function for each organisation can be accessed from the HRA website.

Appendices

The HRA Approval letter contains the following appendices:

- A – List of documents reviewed during HRA assessment
- B – Summary of HRA assessment

After HRA Approval

The document *"After Ethical Review – guidance for sponsors and investigators"*, issued with your REC favourable opinion, gives detailed guidance on reporting expectations for studies, including:

- Registration of research
- Notifying amendments
- Notifying the end of the study

The HRA website also provides guidance on these topics, and is updated in the light of changes in reporting expectations or procedures.

In addition to the guidance in the above, please note the following:

- HRA Approval applies for the duration of your REC favourable opinion, unless otherwise notified in writing by the HRA.
- Substantial amendments should be submitted directly to the Research Ethics Committee, as detailed in the *After Ethical Review* document. Non-substantial amendments should be submitted for review by the HRA using the form provided on the HRA website, and emailed to hra.amendments@nhs.net.
- The HRA will categorise amendments (substantial and non-substantial) and issue confirmation of continued HRA Approval. Further details can be found on the HRA website.

Scope

HRA Approval provides an approval for research involving patients or staff in NHS organisations in England.

If your study involves NHS organisations in other countries in the UK, please contact the relevant national coordinating functions for support and advice. Further information can be found through IRAS.

If there are participating non-NHS organisations, local agreement should be obtained in accordance with the procedures of the local participating non-NHS organisation.

IRAS project ID	236830

User Feedback

The Health Research Authority is continually striving to provide a high quality service to all applicants and sponsors. You are invited to give your view of the service you have received and the application procedure. If you wish to make your views known please use the feedback form available on the HRA website.

HRA Training

We are pleased to welcome researchers and research management staff at our training days – see details on the HRA website.

Your IRAS project ID is **236830**. Please quote this on all correspondence.

Yours sincerely

Beverley Mashegede
Assessor

Email: hra.approval@nhs.net

Copy to: Mr Alex Astor, Sponsor Contact

Rachel Rosenhead, Greater Manchester Mental Health NHS Foundation Trust, Lead NHS R&D Contact

Dr Luna Centifanti, Chief Investigator, Academic Supervisor

IRAS project ID	236830

Appendix A - List of Documents

The final document set assessed and approved by HRA Approval is listed below.

Document	*Version*	*Date*
Evidence of Sponsor insurance or indemnity (non NHS Sponsors only)		27 July 2017
HRA Schedule of Events	2	09 February 2018
HRA Statement of Activities	2	20 January 2018
IRAS Application Form [IRAS_Form_05012018]		05 January 2018
IRAS Application Form XML file [IRAS_Form_15122017]		15 December 2017
IRAS Checklist XML [Checklist_05012018]		05 January 2018
Letter from sponsor [UoL Sponsorship approval letter]		21 November 2017
Other [Complete questionnaire pack]	2	09 February 2018
Other [Response to REC]		09 February 2018
Other [Response to Validation]		03 January 2017
Other [Virtual Reality game information]	1	07 December 2017
Participant information sheet (PIS) [and Consent Form- parents or guardians]	2	09 February 2018
Participant information sheet (PIS) [and Consent Form - participant]	2	09 February 2018
Referee's report or other scientific critique report [Initial response from DClin Research committee]	1	05 July 2017
Research protocol or project proposal [Research proposal]	4	09 February 2018
Summary CV for Chief Investigator (CI) [CI CV]		15 December 2017
Summary CV for student [Student CV]		15 December 2017
Summary CV for supervisor (student research) [Supervisor CV]		15 December 2017

Appendix B - Summary of HRA Assessment

This appendix provides assurance to you, the sponsor and the NHS in England that the study, as reviewed for HRA Approval, is compliant with relevant standards. It also provides information and clarification, where appropriate, to participating NHS organisations in England to assist in assessing and arranging capacity and capability.

For information on how the sponsor should be working with participating NHS organisations in England, please refer to the, *participating NHS organisations, capacity and capability* and *Allocation of responsibilities and rights are agreed and documented (4.1 of HRA assessment criteria)* sections in this appendix.

The following person is the sponsor contact for the purpose of addressing participating organisation questions relating to the study:

Name: Alex Astor
Tel: 01517948739
Email: sponsor@liv.ac.uk

HRA assessment criteria

Section	HRA Assessment Criteria	Compliant with Standards	Comments
1.1	IRAS application completed correctly	Yes	No comments
2.1	Participant information/consent documents and consent process	Yes	The participant information sheets have been updated to show that research data will be stored for 10 years.
3.1	Protocol assessment	Yes	No comments
4.1	Allocation of responsibilities and rights are agreed and documented	Yes	The Sponsor intends to use the Statement of Activities as the form of agreement with participating NHS organisations.
4.2	Insurance/indemnity arrangements assessed	Yes	Where applicable, independent contractors (e.g. General Practitioners) should ensure that the professional indemnity provided by their medical defence organisation covers the activities expected of them for this

IRAS project ID	236830

Section	HRA Assessment Criteria	Compliant with Standards	Comments
			research study.
4.3	Financial arrangements assessed	Yes	No funds will be provided to the participating organisation to support this study.
5.1	Compliance with the Data Protection Act and data security issues assessed	Yes	No comments
5.2	CTIMPS – Arrangements for compliance with the Clinical Trials Regulations assessed	Not Applicable	No comments
5.3	Compliance with any applicable laws or regulations	Yes	No comments
6.1	NHS Research Ethics Committee favourable opinion received for applicable studies	Yes	Favourable Opinion with conditions issued 06 February 2018. Favourable Opinion with conditions met issued 23 February 2018.
6.2	CTIMPS – Clinical Trials Authorisation (CTA) letter received	Not Applicable	No comments
6.3	Devices – MHRA notice of no objection received	Not Applicable	No comments
6.4	Other regulatory approvals and authorisations received	Not Applicable	No comments

Participating NHS Organisations in England

This provides detail on the types of participating NHS organisations in the study and a statement as to whether the activities at all organisations are the same or different.
This is a non-commercial student (Doctorate in Clinical Psychology) study and there is one site type. The Chief Investigator or sponsor should share relevant study documents with participating NHS organisations in England in order to put arrangements in place to deliver the study. The documents should be sent to both the local study team, where applicable, and the office providing the research management function at the participating organisation. For NIHR CRN Portfolio studies, the Local LCRN contact should also be copied into this correspondence. For further guidance on working with participating NHS organisations please see the HRA website. If chief investigators, sponsors or principal investigators are asked to complete site level forms for participating NHS organisations in England which are not provided in IRAS or on the HRA website, the chief investigator, sponsor or principal investigator should notify the HRA immediately at hra.approval@nhs.net. The HRA will work with these organisations to achieve a consistent approach to information provision.

Confirmation of Capacity and Capability

This describes whether formal confirmation of capacity and capability is expected from participating NHS organisations in England.
Participating NHS organisations in England **will be expected to formally confirm their capacity and capability to host this research**. • Following issue of this letter, participating NHS organisations in England may now confirm to the sponsor their capacity and capability to host this research, when ready to do so. How capacity and capacity will be confirmed is detailed in the *Allocation of responsibilities and rights are agreed and documented (4.1 of HRA assessment criteria)* section of this appendix. • The Assessing, Arranging, and Confirming document on the HRA website provides further information for the sponsor and NHS organisations on assessing, arranging and confirming capacity and capability.

Principal Investigator Suitability

This confirms whether the sponsor position on whether a PI, LC or neither should be in place is correct for each type of participating NHS organisation in England and the minimum expectations for education, training and experience that PIs should meet (where applicable).
A Local Collaborator is expected at each participating organisation. GCP training is not a generic training expectation, in line with the HRA/MHRA statement on training expectations.

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HR Good Practice Resource Pack Expectations

This confirms the HR Good Practice Resource Pack expectations for the study and the pre-engagement checks that should and should not be undertaken
As a non-commercial study undertaken by local staff, it is unlikely that letters of access or honorary research contracts will be applicable, except where local network staff employed by another Trust (or University) are involved (and then it is likely that arrangements are already in place). Where arrangements are not already in place, network staff (or similar) undertaking any research activities that may impact on the quality of care of the participant (listed in A18 and A19), would be expected to obtain an honorary research contract from one NHS organisation (if university employed), followed by Letters of Access for subsequent organisations. This would be on the basis of a Research Passport (if university employed) or an NHS to NHS confirmation of pre-engagement checks letter (if NHS employed). These should confirm enhanced DBS checks, including appropriate barred list checks, and occupational health clearance.

Other Information to Aid Study Set-up

This details any other information that may be helpful to sponsors and participating NHS organisations in England to aid study set-up.
The applicant has indicated that they do not intend to apply for inclusion on the NIHR CRN Portfolio.

Appendix 8: Final REC Approval

NHS
Health Research Authority

North West - Liverpool East Research Ethics Committee
Barlow House
3rd Floor
4 Minshull Street
Manchester
M1 3DZ

Please note: This is an acknowledgement letter from the REC only and does not allow you to start your study at NHS sites in England until you receive HRA Approval

23 February 2018

Jane McLachlan
University of Liverpool, Department of Clinical Psychology, Ground Floor, Whelan Building
Brownlow Hill
Liverpool
L69 3GB

Dear Dr McLachlan

Study title:	**Borderline Personality traits and emotion regulation strategies in adolescents: The role of implicit theories**
REC reference:	**18/NW/0034**
Protocol number:	**UoL001345**
IRAS project ID:	**236830**

Thank you for your letter of 09/02/2018. I can confirm the REC has received the documents listed below and that these comply with the approval conditions detailed in our letter dated 06 February 2018

Documents received

The documents received were as follows:

Document	*Version*	*Date*
Other [Complete questionnaire pack]	2	09 February 2018
Other [Response to REC]		09 February 2018
Participant information sheet (PIS) [Information sheet - parents or guardians]	2	09 February 2018

Participant information sheet (PIS) [Information sheet - participant]	2	09 February 2018

Approved documents

The final list of approved documentation for the study is therefore as follows:

Document	*Version*	*Date*
IRAS Application Form [IRAS_Form_05012018]		05 January 2018
IRAS Checklist XML [Checklist_05012018]		05 January 2018
Letter from sponsor [UoL Sponsorship approval letter]	1	21 November 2017
Other [Virtual Reality game information]	1	07 December 2017
Other [Response to Validation]		03 January 2017
Other [Complete questionnaire pack]	2	09 February 2018
Other [Response to REC]		09 February 2018
Participant information sheet (PIS) [Information sheet - parents or guardians]	2	09 February 2018
Participant information sheet (PIS) [Information sheet - participant]	2	09 February 2018
Referee's report or other scientific critique report [Initial response from DClin Research committee]	1	05 July 2017
Research protocol or project proposal [Research proposal]	1	17 November 2017
Response to Additional Conditions Met		
Summary CV for Chief Investigator (CI) [CI CV]	1	15 December 2017
Summary CV for student [Student CV]	1	15 December 2017
Summary CV for supervisor (student research) [Supervisor CV]	1	15 December 2017

You should ensure that the sponsor has a copy of the final documentation for the study. It is the sponsor's responsibility to ensure that the documentation is made available to R&D offices at all participating sites.

18/NW/0034	**Please quote this number on all correspondence**

Yours sincerely

Nafeesa Khanam
REC Assistant

E-mail: nrescommittee.northwest-liverpooleast@nhs.net

Copy to: *Rachel Rosenhead, Greater Manchester Mental Health NHS Foundation Trust*

Appendix 9: Research Proposal

Research Proposal

Name: Jane McLachlan

Title: Borderline personality traits and emotion regulation strategies in adolescents: the role of implicit theories.

I confirm that I have read and approved the attached research proposal documents to be submitted to the University of Liverpool research committee:

Primary Supervisor:
Dr Luna Centifanti
Email:
University of Liverpool
Signed:.....

External Supervisor:
Dr Mani Mehdikhani
Email: mani.mehdikhani@gmmh.nhs.uk
Address:

Signed: ... .

Date of submission: 5th May 2018 **Version**: 5 **IRAS ref:** 236830

Aims:

i) To establish implicit beliefs of emotion associated with Borderline Personality traits.

ii) To establish emotion regulation strategies employed when entity beliefs are endorsed.

iii) If a psychoeducational intervention impacts the type of emotion regulation strategies used and motivation to engage with medication or psychological therapies.

General background:

In the general population, people meeting criteria for Borderline Personality Disorder (BPD) ranges from 0.7% (Coid, Yang, Tyrer, Roberts & Ullrich, 2006) to 1.6% (Lenzenweger, Lane, Loranger, & Kessler, 2007). A core characteristic of BPD is difficulty in regulating emotions. Emotional regulation incorporates a range of phenomena, but an area of focus for this research is maladaptive regulation strategies used when negative emotions are experienced. Emotion dysregulation is a typical feature in adolescence, but is found to be higher amongst adolescents meeting diagnostic criteria for BPD (Ibraheim, Kalpaki & Sharp, 2007). Emotional cascade model (Selby, Anestis & Jojner, 2008) explains how people with BPD employ strategies to manage emotions ad hoc, rather than more antecedent strategies of perspective taking, which can be more effective.

Research into implicit theories of emotion has given initial links between whether a person believes emotion to be fixed and impossible to change (entity theory) and therefore engaging in unhelpful emotion regulation strategies. This research aims to establish early patterns and adapt strategies that lead to maladaptive interpersonal relationships.

Brief account of relevant literature:

Implicit theories

Implicit beliefs or theories were initially studied in an educational context, but have recently been considered for clinical applications. Implicit theories are beliefs about the inherent malleability of certain traits or abilities. If a person believes attributes are fixed and impossible to control, they hold an entity theory. Initial research (Dweck & Leggett, 1988; Hong et al., 1999) assessed implicit

theories of intelligence in school children. They found that children endorsing incremental beliefs view attributes as malleable and controllable. This leads to a flexible interpretation of events and assertive attempts at self-regulation in the face of challenges. On the other hand, children who endorsed an entity theory of intelligence were found to have increased concern about their performance, attribute mistakes to their own ability and believe changes cannot be overcome through exerting additional effort. As they believe their weaknesses cannot be improved, entity theorists are also vulnerable to poorer coping strategies under stress (Doran, Stephen, Boiche & La Scanff, 2009) and reduced self-esteem (Rhodewalt, 1994).

Implicit theories of emotion

Initially, implicit theories focused on trait-like attributes, such as intelligence and personality. Tamir, John, Srivastava and Gross (2007) moved the research towards more transient attributes, such as emotion. In a clinical context, this is important given that modulating emotions has been linked to a wide array of undesirable health outcomes (Gross, 2013).

Tamir et al. (2007) explored implicit beliefs during transition to college, as individual differences in implicit theories are apparent during challenging times. It was found that students who viewed emotions as malleable felt a greater sense of efficacy in regulating their emotions and used cognitive reappraisal more frequently, even when controlling for emotional intensity. Furthermore, it was found that more negative and fewer positive emotions were experienced by entity theorists. De Castella et al. (2013) extended on these findings to show entity theory to be associated with less frequent use of reappraisal, lower levels of well-being (reduced self-esteem) and increased psychological distress (stress and depression).

Both studies were limited in the range of emotion regulation strategies explored in association with implicit beliefs. Whilst links were found with cognitive reappraisal, associations with implicit beliefs and expressive suppression were less consistent (Tamir et al., 2007; Schroder et al., 2014). Kneeland et al. (2016) incorporated a wider range of strategies, including self-blame, rumination, acceptance and perspective taking in an experimental manipulation of implicit beliefs about emotion.

Only two of the seven strategies were found to be significant in the expected direction following manipulation of implicit beliefs of emotion. De Castella et al. (2013) found implicit beliefs of own emotions explained emotion regulation strategies more than beliefs about emotions in general.

More recent research has expanded the domains of implicit theories to include anxiety rather than emotions in general (Schroder et al. 2016). The novel finding has been that implicit theories of anxiety appear to be uniquely related to cognitive reappraisal and expressive suppression and were most predictive of psychological symptoms.

Emotion regulation in BPD

Research has not explored emotion regulation patterns and implicit beliefs in a clinical sample. Emotion dysregulation is a complex construct and past research has focused on emotional sensitivity, experiencing high levels of negative affect, having inadequate emotion regulation strategies and using maladaptive emotion regulation strategies (Carpenter & Trull, 2014). For the present research, we will focus on maladaptive emotion regulation strategies, particularly cognitive strategies such as rumination. In BPD and other mental health difficulties, both maladaptive behavioural and cognitive strategies have been observed. The emotional cascade model (Selby, Anestis & Joiner 2008) explains how these two facets are integrated. People ruminate intensely about an event that initiates negative emotions, which aggravate each other reciprocally over time (Moberly & Watkins, 2008). This self-amplifying positive feedback loop results in an extremely aversive and painful emotional state. Dysregulated behaviours, such as self-harm or binge eating, then serve to distract from rumination through shifting to physical sensations (via dysregulated behaviours), thus granting the person temporary relief, but resulting in a whole suite of behaviours that may become problematic in their own right.

Hypotheses:

1. Higher prevalence of Borderline Personality traits will be associated with an entity theory of emotion or anxiety.

2. Entity theorists are more likely to engage in unhelpful emotion regulation strategies, such as rumination, self-blame and thought suppression.
3. Entity theorists will be less motivated to engage in psychological therapies, as they do not believe change of emotions is within their control.
4. Manipulation of emotion beliefs will result in an increase of more effective emotion regulation strategies (reappraisal, acceptance, positive refocus).

Design: Within-participants design

Participants/sampling/access:

Adolescents (aged 13 to 17) accessing a specialist child and adolescent mental health (CAMH) NHS service at Junction 17, Prestwich will be recruited. Similar NHS inpatient units at Chester, Warrington and Heysham will also be approached. Junction 17 is an inpatient unit, with 13 beds, for adolescents experiencing a range of complex mental health difficulties. There are approximately 2 to 4 admissions to the unit each week. Since BPD cannot be diagnosed under the age of 18, all children and adolescents accessing the unit will be approached to participate. This will be ensured by approaching all individuals who are admitted and meet the inclusion criteria.

G*power calculations (Faul, Erdfelder, Lang, & Buchner, 2007) were utilised to estimate the minimum number of participants required to detect medium effects at .80 power at a significance level of .05. Effect sizes were calculated for the main hypothesis, relating to the intervention. This effect size was selected in line with previous research using a similar protocol into implicit theories which has typically yielded large effect sizes (Salekin, Sellers & Lester, 2012). The results indicated that 27 participants will be required for a paired sample t-test. Any calculations of correlation are explorations, and effect sizes have therefore not been calculated. If significance is not found for these, Bayesian probability, which considers small sample sizes, can determine potential relationships.

Inclusion criteria: i) the child is aged 13 to 17 years (due to the self-report measure being validated on this age group), ii) the child is in an inpatient setting for emotional difficulties, iii) the child and parent/carer can understand written and verbal English.

Exclusion criteria: i) learning or intellectual disabilities, ii) current episode of psychosis, iii) current substance misuse.

Permission of ethics committee: HRA approval and NHS Research Ethics Committee approval will be sought from the National Research Ethics Service via the Integrated Research Application System (IRAS). University of Liverpool Doctorate of Clinical Psychology committee approval will also be sought. Confirmation of capacity and capability will be sought from the research site.

Procedure

All individuals/families who come through the inpatient specialist adolescent mental health services for young people will be approached to participate in this study. There is a meeting arranged to confirm support from Junction 17, and the other two sites will be approached following this. All individuals who meet inclusion criteria specified above will be approached; therefore, everyone has an opportunity to take part in the research.

The researcher will approach children, adolescents and their families/parents (if the child is under 16 years old) on the inpatient ward. Those who meet inclusion criteria will be invited to participate. Age-appropriate information sheets will be given to the children, adolescents and their families/parents (if the child is under 16 years old). These will provide details of the research and will confirm that i) any information provided will be anonymised and treated confidentially, ii) participants have a right to withdraw at any stage of the research, iii) consenting to the study is completely voluntary, and iv) participation in and/or withdrawal from the research will have no effect on the services participants receive.

Consistent with ethical guidelines (Boddy et al., 2010), parental consent will be sought via telephone for all participants under 16 prior to the young person completing the questionnaires. As long as under 16s who have provided written consent have the capacity to consent, formal written consent from parents will not be required for under 16s to participate under Gillick competency. Those aged 16 years and above will complete a consent form prior to completing the questionnaires.

Questionnaires will be completed on paper-based forms. The individual will receive support to complete them as necessary, by the researcher. The lead researcher will only carry out data collection with those who have been asked and have consented to filling in questionnaires with them.

Individuals will then play a virtual reality (VR) game called In Mind, which takes the player through the neurons of the brain. This game is available free online and is approved for all ages, but has not previously been used in research. Before playing, the researcher will give the participant some information regarding emotions and their malleability. The information given is the main intervention and is consistent with previous research (Salekin, Sellers & Lester, 2012), whilst the game is a means of engaging the young people. After finishing the game, the adolescent will be asked to rate motivation for the two treatment choices again.

A debrief information sheet will be given to the participants to explain the use of language in the questionnaires. This information sheet will explain the term 'Borderline personality traits' and emphasise that this is not meant as a diagnostic tool.

There will be a delay of one week before the adolescents will be approached to repeat the Cognitive Emotion Regulation Questionnaire. The short time delay reduces the chance of losing participants due to discharge from the unit. If they have been discharged from the unit at this point, permission will be sought to post questionnaires to a home address or complete them over the telephone with the researcher.

The researcher can visit the sites weekly, and carry out follow-ups on the same day as initial trials with participants.

Participants will be given remuneration for participating in the form of a £6 'Love to shop' voucher. During the first phase of participating, they will be given a £3 voucher, and the remaining £3 to be given upon completion of the follow-up questionnaires.

Measures / Materials

Demographic characteristics: Information regarding the child's age, gender, ethnicity and current treatments will be collected in a form alongside the questionnaires.

Borderline Personality traits: Borderline Personality features scale for children (Crick et al., 2005).

Implicit theories: Implicit theories of emotions in general (TOE; Tamir et al., 2007) and own emotions (De Castella et al., 2013). Both scales contain two incremental and two entity statements.

Emotion regulation strategies: Cognitive Emotion Regulation Questionnaire (CERQ; Garnefski, Kraaij & Spinhoven, 2001) is a 36-item trait measure of cognitive emotion regulation strategies, including rumination, self-blame, acceptance and cognitive reappraisal.

Motivation for treatment: The motivation to engage in medical treatment or psychological treatment will be explored using a question based on previous research in this area (Schroder et al., 2012). Participants will be given the following question and asked to opt for a specific treatment.

"If you struggle, or were to struggle with emotional difficulties (e.g. uncontrollable outbursts of anger, intense sadness) and had a choice between some form of psychological intervention, mediation, a combination of medication and psychological intervention or no treatment other than standard monitoring to help you with these difficulties, which would you choose?" Brief descriptors of each of these treatment types will be given.

Measure of flow: A measure of how absorbed the young people are in the VR game (adapted from Engeser and Rheinberg, 2008).

Virtual reality equipment and programme: VR equipment is available through the primary supervisor. A small introduction will be read out by the researcher before starting the VR game. The information will be a message about the malleability of emotions. Example footage is available at: https://www.youtube.com/watch?v=qZzOrZ5D5_c&t=77s

Data analysis & Archiving

The data will be analysed using SPSS using a paired samples t-test (assuming data is parametric) to examine differences in emotion regulation before and after the intervention. Multiple imputations can be used to analyse any incomplete data. A Pearson's correlation will explore associations between motivation to engage with certain treatments and implicit bias. If there is no significance found, the primary supervisor is prepared to supervise in the use of Bayesian probability, which will allow for small sample sizes.

Any information collected will be kept strictly confidential and conform to the Data Protection Act 1998. All participants' identities will be kept anonymous. Dr Luna Centifanti will be the data custodian. During data collection, all paper copies of questionnaires will be stored by the primary supervisor in a locked cabinet at the University of Liverpool. This information will not be shared with anyone outside of the project without participants' consent. The information will be destroyed after a minimum of 10 years following completion of the study.

Service user/carer consultation

The Liverpool Experts by Experience (LExE) group were consulted at the University of Liverpool on 13th March 2017 with regards to the project's utility and feasibility. A meeting will be arranged with the Experts by Experience group at Junction 17, consisting of adolescents with lived mental health experience. Advice will be sought around the protocol and the use of shopping vouchers as an incentive for participation in this setting. The site will review and make suggestions for protocol and data collection.

End of Study

It is anticipated that the study will end at the end of September 2019.

Publication

The research is intended to be published in Cognitive Therapy and Research.

Proposed timeline

May 2017	Submit proposal to the University of Liverpool research committee
June 2017	Receive feedback, address amendments and re-submit proposal
Sept 2017	Submit to ethics committee (CORE) once proposal has been approved
Nov 2017	Prepare questionnaires, information sheets, information for VR and begin literature review
Jan – Sept 2018	Recruit participants. Write introduction & methods section
June 2018	Submit first draft of introduction and method section to supervisors
Oct 2018	Begin data analysis & writing up the results section
Jan – March 2019	Write the discussion section
March 2019	Submit first full draft to supervisors and make amendments
June 2019	Submit final thesis

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Appendix 10: Parent/Guardian Information Sheet

Parent/Guardian Information Sheet
Doctorate in Clinical Psychology

Study title: Emotion regulation strategies and beliefs about emotion

Research investigator: Jane McLachlan (Trainee Clinical Psychologist)

Researcher contact details:

Doctorate in Clinical psychology,
University of Liverpool
Whelan Building
Brownlow Hill
Liverpool
L69 7ZX

Jane.mclachlan@liverpool.ac.uk

Invitation

Your child is being invited to take part in our research study looking at young people's beliefs about feelings and what they do to cope with difficult feelings. Before you decide whether you would like your child to take part, we would like you to understand why the research is being done and what it would mean for your child. Please read this information sheet and the researcher will be happy to answer any questions you have (contact details are given above). Please ask if there is anything that is not clear. Please take your time to decide if you would like your child to take part.

Why has your child been invited?

All young people entering the Junction 17 unit will be asked by a member of the team if they are interested in taking part. In total, 26 young people will be asked to take part in this study. These may be from this unit or similar locations in the North West.

What will happen?

If you say 'yes', then we will talk to your child about whether they want to take part. Your child will only take part I both you and s/he say 'yes'. Your child will be asked to meet with the researcher two times. At the first meeting, they will be asked to complete 5 short questionnaires. These questionnaires will be asking them about their beliefs about feelings and the type of things they do to help cope with difficult feelings.

After they have finished the questionnaires, they will play a virtual reality game. The virtual reality game involves wearing a headset. They will be given some information from the researcher before playing this game.

The second meeting will be shorter. Your child will be asked to repeat some of the questionnaires they had filled out at the first meeting. If they would like to, they may play the game again at this point.

The researcher will also ask for your permission to gather further information about your child. This will be done by looking at their case file and noting any information important to how your child may be affected by receiving information about how people improve with treatment.

What if my child is discharged before they finish the study?

They can still take part. If they have completed the first part of the study (with the virtual reality), then the second part can be completed over the phone. If you and your child are happy to do this, there is a space for your contact information at the end of this form. They can also come back into the unit, if they prefer to do the questionnaires in person. We can arrange this over the phone.

Does my child have to take part?

No. It is up to you and your child if you would like to take part in this study. We will describe the study and go through the information sheet. If you both would like to take part, we will then ask both you and your child to sign a consent form. We will give you both a copy of this information sheet and your signed forms to keep.

If you both say yes, and then either you or your child decide you do not want to take part, they are free to stop at any time, without giving a reason. If you no longer wish for your child to take part during the study, please tell the researcher or a member of staff. If you decide to stop, this will not affect the care your child receives.

How much time will this take?

The study may take about one hour for the first session, with a shorter time for the second meeting. To thank your child for their time, we will give them a £3 Love2Shop voucher at each of these sessions.

Are there any risks or benefits to taking part?

The questionnaires are designed or have been used on young people before. However, some young people may find some questions uncomfortable. If this does happen, we will ask all young people to let the researcher know and we can take a break or stop. It is rare, but the virtual reality game may make some people feel a little sick. Again, if this happens, we will ask your child to tell the researcher and we will stop.

The research is looking at the way young people think about their feelings. We cannot promise that the study will help your child in coping with difficult feelings. However, the information we get from this study may help us with future work with other young people.

Will anyone else know that my child is doing this?

No. All information used will be given a code, so that your child's name or any other identifiable information, will not appear next to any of the results. This means all personal information is kept confidential. The researcher will follow a set of rules to keep your child and their information safe.

All data will be grouped together as a big set of numbers. Nobody's scores will be looked at on their own. A summary of the results may be shared at conferences and in research journals. We will make sure that it is not possible to identify any individual from any of the information we publish and share about this study.

There are two times when the researcher may choose not to keep things confidential. This is if your child says anything that means there is risk to them or to other people. If this happens the researcher may need to tell the right member of staff for their care within the unit.

How is the information stored?

Answers to the questionnaires will be typed up onto a computer alongside each young person's code. This means if someone looks, they cannot tell who has given the answers. All the results, without any names or identifiable information, will be kept for ten years on a public database at the University of Liverpool.

Any information with your child's name on it, such as consent forms, will be kept in a locked area in the NHS building you are at. These papers will be destroyed once the last young person has taken part.

Who is organising and funding this study?

The study is being carried out as part of a doctorate degree in Clinical Psychology at the University of Liverpool. All research in the NHS is looked at by an independent group of people, called a Research Ethics Committee, who are there to protect your child's interests. This study has been reviewed and given favourable opinion by this committee, the University sponsors and the NHS ethics committee.

Further information

The researcher will be glad to answer your questions about this study at any time and can inform you about the results of the study once data collection is complete. You may contact her on jane.mclachlan@liverpool.ac.uk.

What if I want to complain?

If for any reason you are not happy, and the researcher has not been able to answer your concerns, you can contact the Customer Care Team using the information below.

Greater Manchester Mental Health NHS Foundation Trust
Trust HQ
Nury New Road
Prestwich
Manchester
M25 3BL
0800 587 4793
customercare@gmmh.nhs.uk

Additional information following GDPR implementation

University of Liverpool is the sponsor for this study based in the United Kingdom. We will be using information from your child and their medical records in order to undertake this study and will act as the data controller for this study. This means that we are responsible for looking after your information and using it properly. University of Liverpool will keep identifiable information about you for 10 years after the study has finished.

Your rights to access, change or move your information are limited, as we need to manage your information in specific ways in order for the research to be reliable and accurate. If you withdraw from the study, we will keep the information about you that we have already obtained. To safeguard your rights, we will use the minimum personally-identifiable information possible.

You can find out more about how we use your information by contacting Jane McLachlan (jane.mclachlan@liverpool.ac.uk). Our Data Protection Officer is Victoria Heath and you can contact them at V.Heath@liverpool.ac.uk.

Consent form – Parents/guardians

Project name: Emotion regulation strategies and beliefs about emotions

Description: A study looking at young people's beliefs about feelings and what they do to cope with horrible feelings.

I confirm that (please tick all that you agree with):

☐I have read and understand the Participant Information Sheet.

☐Questions about my child taking part in this study have been answered well for me.

☐Only data which cannot be traced back to my child may be shared with the public.

☐I am willing for my child to take part in this study of my own free will.

☐The researcher can access my child's case notes for further review.

Your name (print) *

Your signature *

Child's name (print) *

Today's date

Researcher's name

Researcher's signature

*If you wish to keep some degree of anonymity, you may use your initials (from the British Psychological Society Guidelines for Minimal Standards of Ethical Approval in Psychological Research)

☐ If my child is discharged before finishing the study, I am happy for the researcher to contact me or my child on:

_____

☐We would like to receive the results from the study, once it is finished. Please post these to:

_____

_____

_____

Appendix 11: Participant Information Sheet

Participant Information Sheet
Doctorate in Clinical Psychology

Study title: Emotion regulation strategies and beliefs about emotion

Research investigator: Jane McLachlan (Trainee Clinical Psychologist)

Researcher contact details:

Doctorate in Clinical psychology,
University of Liverpool
Whelan Building
Brownlow Hill
Liverpool
L69 7ZX

Jane.mclachlan@liverpool.ac.uk

Invitation

We would like to invite you to take part in our research study looking at young people's beliefs about feelings and what you do to cope with horrible feelings. Before you decide, we would like you to understand why the research is being done and what it would mean for you. The researcher will go through this information sheet with you and answer any questions you have. Please ask if there is anything that is not clear. Please take your time to decide if you would like to take part.

Why have I been invited?

All young people entering the Junction 17 unit will be asked by a member of the team if they are interested in taking part. In total, 26 young people will be asked to take part in this study. These may be from this unit or similar locations in the North West.

What will happen?

If you have said yes to taking part, you will be asked to meet with the researcher two times. At the first meeting, you will be asked to complete 5 short questionnaires. These questionnaires will be asking you about your beliefs about your feelings and the type of things you do to help cope with difficult feelings.

There are no right or wrong answers and it will be helpful if you could answer as honestly as you can. The researcher will take you through each of them and answer any questions that you may have. The researcher can help you to complete these if you prefer.

After you have finished the questionnaires, you will play a virtual reality game. The virtual reality game involves wearing a headset. You will be given some information from the researcher before playing this game.

The second meeting will be shorter. You will be asked to repeat some of the questionnaires you had filled out at the first meeting. If you would like to, you may play the game again at this point.

The researcher will also ask for your permission to gather further information about you. This will be done by looking at your case file and noting any information important to how you may be affected by receiving information about how people improve with treatment.

What if I am discharged before I finish the study?

You can still take part. If you have completed the first part of the study (with the virtual reality), then the second part can be completed over the phone. If you are happy to do this, there is a space for your contact information at the end of this form. You can also come back into the unit, if you prefer to do the questionnaires in person. We can arrange this over the phone.

Do I have to take part?

No. It is up to you if you would like to take part in this study. We will describe the study and go through the information sheet. If you would like to take part, we will then ask you to sign a consent form. If you are under the age of 16, we will also ask your parent/guardian for consent. We will give you both a copy of this information sheet and your signed forms to keep.

If you say yes, and then you decide you do not want to take part, you are free to stop at any time, without giving a reason. If you wish to stop taking part during the study, please tell the researcher, your parent/guardian or a member of staff. If you decide to stop, this will not affect the care you receive.

How much time will this take?

The study may take about one hour for the first session, with a shorter time for the second meeting. To thank you for your time, we will give you a £3 Love2Shop voucher at each of these sessions.

Are there any risks or benefits to taking part?

Some of the questions may make you feel uncomfortable. If this does happen, please let the researcher know and we can take a break or stop. It is rare, but the virtual reality game may make you feel a little sick. Again, if this happens, please tell the researcher and we will stop.

The research is looking at the way young people think about their feelings. We cannot promise that the study will help you in coping with difficult feelings. However, the information we get from this study may help us with future work with other young people like you.

Will anyone else know that I am doing this?

No. All information used will be given a code, so that your name or any other information that makes it obvious who you are, will not appear next to any of the results. This means your personal information is kept confidential. The researcher will follow a set of rules to keep you and your information safe.

All data will be grouped together as a big set of numbers. Nobody's scores will be looked at on their own. A summary of the results may be shared at conferences and in research journals. We will make sure that it is not possible to identify you from any of the information we publish and share about this study.

There are two times when the researcher may choose not to keep things confidential. This is if you say anything that means there is risk to yourself or to other people. If this happens the researcher may need to tell the right member of staff for your care. This is because your safety is important to us.

How is the information stored?

Answers to the questionnaires will be typed up onto a computer alongside your code. This means if someone looks, they cannot tell who have given the answers. All the results, without any names, will be kept for ten years on a public database at the University of Liverpool.

Any information with your name on it, such as consent forms, will be kept in a locked area in the NHS building you are at. These papers will be destroyed once the last young person has taken part.

Who is organising and funding this study?

The study is being carried out as part of a doctorate degree in Clinical Psychology at the University of Liverpool. All research in the NHS is looked at by an independent group of people, called a Research Ethics Committee, who are there to protect your interests. This study has been reviewed and given favourable opinion by this committee, the University sponsors and the NHS ethics committee.

Further information

The researcher will be glad to answer your questions about this study at any time and can inform you about the results of the study once data collection is complete. You may contact her on jane.mclachlan@liverpool.ac.uk.

What if I want to complain?

If for any reason you are not happy, and the researcher has not been able to answer your concerns, you can contact the Customer Care Team using the information below.

Greater Manchester Mental Health NHS Foundation Trust
Trust HQ
Nury New Road
Prestwich
Manchester
M25 3BL
0800 587 4793
customercare@gmmh.nhs.uk

Additional information following GDPR implementation

University of Liverpool is the sponsor for this study based in the United Kingdom. We will be using information from you and your medical records in order to undertake this study and will act as the data controller for this study. This means that we are responsible for looking after your information and using it properly. University of Liverpool will keep identifiable information about you for 10 years after the study has finished.

Your rights to access, change or move your information are limited, as we need to manage your information in specific ways in order for the research to be reliable and accurate. If you withdraw from the study, we will keep the information about you that we have already obtained. To safeguard your rights, we will use the minimum personally-identifiable information possible.

You can find out more about how we use your information by contacting Jane McLachlan (jane.mclachlan@liverpool.ac.uk). Our Data Protection Officer is Victoria Heath and you can contact them at V.Heath@liverpool.ac.uk.

Consent form

Project name: Emotion regulation strategies and beliefs about emotions

Description: A study looking at young people's beliefs about feelings and what they do to cope with horrible feelings.

I confirm that (please tick all that you agree with):

☐I have read and understand the Participant Information Sheet.

☐Questions about my taking part in this study have been answered well for me.

☐Only data which cannot be traced back to me may be shared with the public.

☐I am willing to take part in this study of my own free will.

☐The researcher can access my case notes for further review.

Your name*

Your signature*

Today's date

Researcher's name

Researcher's signature

*If you wish to keep some degree of anonymity, you may use your initials (from the British Psychological Society Guidelines for Minimal Standards of Ethical Approval in Psychological Research)

☐ If I am discharged before finishing the study, I am happy for the researcher to contact me on:

_____

☐We would like to receive the results from the study, once it is finished. Please post these to:

_____

_____

_____

Appendix 12: Demographic Sheet

Participant information sheet

Age: ……..

Sex:

☐Male ☐ Female

Ethnicity: ……

- ☐ White British
- ☐ White English/Scottish/Welsh/Northern Irish
- ☐ White Irish
- ☐ White other
- ☐ Mixed – White/Black Caribbean
- ☐ Mixed – White/Black African
- ☐ Mixed – White and Asian
- ☐ Mixed – Other
- ☐ Asian/ Asian British – Indian
- ☐ Asian/ Asian British – Pakistani
- ☐ Asian/ Asian British – Bangladeshi
- ☐ Asian/ Asian British – Chinese
- ☐ Asian/ Asian British – Other
- ☐ Black African British
- ☐ Black Caribbean British
- ☐ Black British other
- ☐ Other ethnic group

Appendix 13: Questionnaire Pack

How I Feel About Myself and Others

Taken from Crick, Murray-Close & Woods (2005)

Instructions: Here are some statements about the way you feel about yourself and other people. Put an X in the box that tells how true each statement is about you.

1. I'm a pretty happy person.

Not at All True	Hardly Ever True	Sometimes True	Often True	Always True

2. I feel very lonely.

Not at All True	Hardly Ever True	Sometimes True	Often True	Always True

3. I get upset when my parents or friends leave town for a few days.

Not at All True	Hardly Ever True	Sometimes True	Often True	Always True

4. I do things that other people consider wild or out of control.

Not at All True	Hardly Ever True	Sometimes True	Often True	Always True

5. I feel pretty much the same way all the time. My feelings don't change very often.

Not at All True	Hardly Ever True	Sometimes True	Often True	Always True

6. I want to let some people know how much they've hurt me.

Not at All True	Hardly Ever True	Sometimes True	Often True	Always True

7. I do things without thinking.

Not at All True	Hardly Ever True	Sometimes True	Often True	Always True

8. My feelings are very strong. For instance, when I get mad, I get really really mad. When I get happy, I get really really happy.

Not at All True	Hardly Ever True	Sometimes True	Often True	Always True

9. I feel that there is something important missing about me, but I don't know what it is.

Not at All True	Hardly Ever True	Sometimes True	Often True	Always True

10. I've picked friends who have treated me badly.

Not at All True	Hardly Ever True	Sometimes True	Often True	Always True

11. I'm careless with things that are important to me.

Not at All True	Hardly Ever True	Sometimes True	Often True	Always True

12. I change my mind almost every day about what I should do when I grow up.

Not at All True	Hardly Ever True	Sometimes True	Often True	Always True

13. People who were close to me have let me down.

Not at All True	Hardly Ever True	Sometimes True	Often True	Always True

14. I go back and forth between different feelings, like being mad or sad or happy.

Not at All True	Hardly Ever True	Sometimes True	Often True	Always True

15. I get into trouble because I do things without thinking.

Not at All True	Hardly Ever True	Sometimes True	Often True	Always True

16. I worry that people I care about will leave and not come back.

Not at All True	Hardly Ever True	Sometimes True	Often True	Always True

17. When I'm mad, I can't control what I do.

Not at All True	Hardly Ever True	Sometimes True	Often True	Always True

18. How I feel about myself changes a lot.

Not at All True	Hardly Ever True	Sometimes True	Often True	Always True

19. When I get upset, I do things that aren't good for me.

Not at All True	Hardly Ever True	Sometimes True	Often True	Always True

20. Lots of times, my friends and I are really mean to each other.

Not at All True	Hardly Ever True	Sometimes True	Often True	Always True

21. I get so mad I can't let all my anger out.

Not at All True	Hardly Ever True	Sometimes True	Often True	Always True

22. I get bored very easily.

Not at All True	Hardly Ever True	Sometimes True	Often True	Always True

23. I take good care of things that are mine.

Not at All True	Hardly Ever True	Sometimes True	Often True	Always True

24. Once someone is my friend, we stay friends.

Not at All True	Hardly Ever True	Sometimes True	Often True	Always True

Beliefs about emotions

Taken from Tamir et al. (2007) and De Castella et al. (2013)

Instructions: Here are some statements about our emotions. Put an X in the box that tells how much you agree or disagree with the sentence.

1. If they want to, people can change the emotions that they have

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree

2. Everyone can learn to control their emotions

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree

3. No matter how hard they try, people can't really change the emotions that they have

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree

4. The truth is, people have very little control over their emotions

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree

5. If I want to, I can change the emotions that I have

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree

6. I can learn to control my emotions

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree

7. The truth is, I have very little control over my emotions

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree

8. No matter how hard I try, I can't really change the emotions that I have

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree

Treatment choice
Taken from Schroeder et al. (2012)

If you struggle, or were to struggle with emotional difficulties (for example, uncontrollable outbursts of anger, intense sadness) and had a choice between:

- Some form of psychological intervention
- Medication
- A combination of medication and psychological intervention or
- No treatment other than standard monitoring to help you with these difficulties,

which would you choose?

Put an X in the one that you would choose.

Some form of psychological intervention	Medication	A combination of medication and psychological intervention	No treatment other than standard monitoring to help you with these difficulties

How do you cope with events?

Taken from Garnefski, Kraaij & Spinhoven (2001)

Instructions: Everyone gets confronted with negative or unpleasant events now and then and everyone responds to them in his or her own way. By the following questions you are asked to indicate what you generally think, when you experience negative or unpleasant events – put an X in the box you think fits best for you.

1. I feel that I am the one to blame for it

(Almost) never	Sometimes	Regularly	Often	(Almost) always

2. I think that I have to accept that this has happened.

(Almost) never	Sometimes	Regularly	Often	(Almost) always

3. I often think about how I feel about what I have experienced.

(Almost) never	Sometimes	Regularly	Often	(Almost) always

4. I think of nicer things than what I have experienced.

(Almost) never	Sometimes	Regularly	Often	(Almost) always

5. I think of what I can do best.

(Almost) never	Sometimes	Regularly	Often	(Almost) always

6. I think I can learn something from the situation.

(Almost) never	Sometimes	Regularly	Often	(Almost) always

7. I think that it all could have been much worse.

(Almost) never	Sometimes	Regularly	Often	(Almost) always

8. I often think that what I have experienced is much worse than what others have experienced.

(Almost) never	Sometimes	Regularly	Often	(Almost) always

9. I feel that others are to blame for it.

(Almost) never	Sometimes	Regularly	Often	(Almost) always

10. I feel that I am the one who is responsible for what has happened.

(Almost) never	Sometimes	Regularly	Often	(Almost) always

11. I think that I have to accept the situation.

(Almost) never	Sometimes	Regularly	Often	(Almost) always

12. I am preoccupied with what I think and feel about what I have experienced.

(Almost) never	Sometimes	Regularly	Often	(Almost) always

13. I think of pleasant things that have nothing to do with it.

(Almost) never	Sometimes	Regularly	Often	(Almost) always

14. I think about how I can best cope with the situation.

(Almost) never	Sometimes	Regularly	Often	(Almost) always

15. I think that I can become a stronger person as a result of what has happened.

(Almost) never	Sometimes	Regularly	Often	(Almost) always

16. I think that other people go through much worse experiences.

(Almost) never	Sometimes	Regularly	Often	(Almost) always

17. I keep thinking about how terrible it is what I have experienced.

(Almost) never	Sometimes	Regularly	Often	(Almost) always

18. I feel that others are responsible for what has happened.

(Almost) never	Sometimes	Regularly	Often	(Almost) always

19. I think about the mistakes I have made in this matter.

(Almost) never	Sometimes	Regularly	Often	(Almost) always

20. I think that I cannot change anything about it.

(Almost) never	Sometimes	Regularly	Often	(Almost) always

21. I want to understand why I feel the way I do about what I have experienced.

(Almost) never	Sometimes	Regularly	Often	(Almost) always

22. I think of something nice instead of what has happened.

(Almost) never	Sometimes	Regularly	Often	(Almost) always

23. I think about how to change the situation.

(Almost) never	Sometimes	Regularly	Often	(Almost) always

24. I think that the situation also has its positive sides.

(Almost) never	Sometimes	Regularly	Often	(Almost) always

25. I think that it hasn't been too bad compared to other things.

(Almost) never	Sometimes	Regularly	Often	(Almost) always

26. I often think that what I have experienced is the worst that can happen to a person.

(Almost) never	Sometimes	Regularly	Often	(Almost) always

27. I think about the mistakes others have made in this matter.

(Almost) never	Sometimes	Regularly	Often	(Almost) always

28. I think that basically the cause must lie within myself.

(Almost) never	Sometimes	Regularly	Often	(Almost) always

29. I think that I must learn to live with it.

(Almost) never	Sometimes	Regularly	Often	(Almost) always

30. I dwell upon the feelings the situation has evoked in me.

(Almost) never	Sometimes	Regularly	Often	(Almost) always

31. I think about pleasant experiences.

(Almost) never	Sometimes	Regularly	Often	(Almost) always

32. I think about a plan of what I can do best.

(Almost) never	Sometimes	Regularly	Often	(Almost) always

33. I look for the positive sides to the matter.

(Almost) never	Sometimes	Regularly	Often	(Almost) always

34. I tell myself that there are worse things in life.

(Almost) never	Sometimes	Regularly	Often	(Almost) always

35. I continually think how horrible the situation has been.

(Almost) never	Sometimes	Regularly	Often	(Almost) always

36. I feel that basically the cause lies with others.

(Almost) never	Sometimes	Regularly	Often	(Almost) always

Measure of flow

Adapted from Rheinberg, Vollmeyer & Engeser (2003) and Engeser & Rheinberg (2008)

Rate how you feel for the following statements whilst playing the virtual reality game:

	not at all			partly			very much
I feel just the right amount of challenge.	○	○	○	○	○	○	○
My thoughts/activities run fluidly and smoothly.	○	○	○	○	○	○	○
I don't notice time passing.	○	○	○	○	○	○	○
I have no difficulty concentrating.	○	○	○	○	○	○	○
My mind is completely clear.	○	○	○	○	○	○	○
I am totally absorbed in what I am doing.	○	○	○	○	○	○	○
The right thoughts/movements occur of their own accord.	○	○	○	○	○	○	○
I know what I have to do each step of the way.	○	○	○	○	○	○	○
I feel that I have everything under control.	○	○	○	○	○	○	○
I am completely lost in thought.	○	○	○	○	○	○	○

Appendix 14: Vignette Provided to Participants

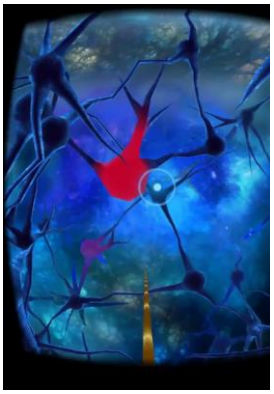
This is Joe. Joe has always had strong feelings. When he was happy, he was really happy – running around, laughing and joking with his friends. When he was mad with someone, he could burst out in anger very quickly. When he was sad, he found himself getting really low quickly, was unable to shake it off and sometimes cried uncontrollably.

Joe wondered what was going on and whether he could control his feelings. He decided to find out.

It turns out that there had been recent research into feelings. Joe found that the research said feelings were dynamic and changeable. Researchers have looked at activity in the brain and the brain is changeable too. So, patterns of behaving translate into brain patterns but these patterns can be reversed through hard work. Researchers found that things, like what we do often, the activities we join in, the focus we have on managing our feelings and experiences we have over time, can affect how we feel about our feelings. This can then affect the way we experience feelings.

Joe thought about this research and what it meant to him.

Joe would like to take you on a journey through his brain to help him notice and manage these feelings. Help him to work hard to change those brain patterns so that his feelings can improve and feel more manageable. While you travel through, you will look for the parts of the brain (we call these neurons and they look like this (look at picture on left)) that are having strong feelings. You will know this because they will be glowing red. Joe would like you to help him do things differently and so not feel this emotion so strongly. You can help him by looking at the glowing neuron and firing at it. This is similar to a lot of psychological help that is out there. So, we know that talking therapies and medicines both can change the brain and the way it reacts to events. You have the power to change Joe's brain to help him out.

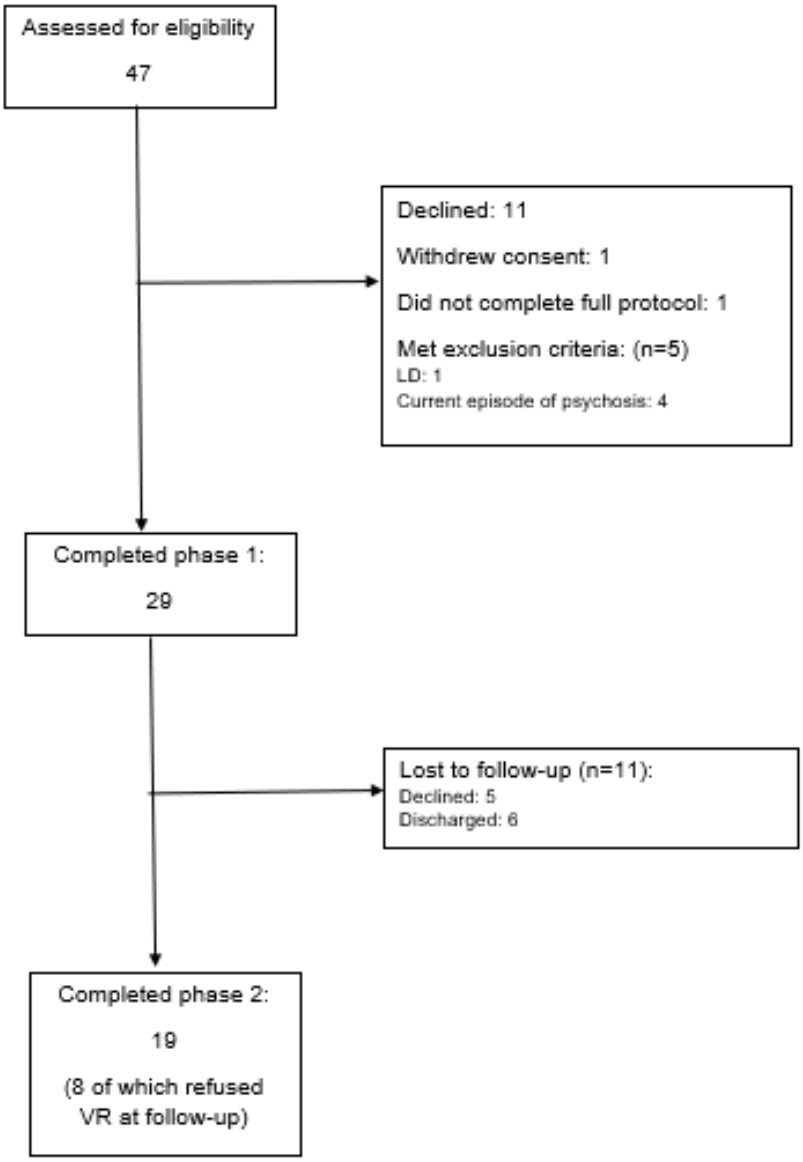


If you have any questions at any point or would like to stop. Please tell the researcher with you.

Appendix 15: Full list of Cronbach Alpha Reliability Scores for Empirical Measures

Variable	Cronbach's α Time 1	Cronbach's α Time 2
Acceptance - CERQ	0.666	0.638
Rumination - CERQ	0.884	0.695
Positive refocus - CERQ	0.873	0.884
Refocus Planning - CERQ	0.823	0.672
Positive reappraisal - CERQ	0.808	0.864
Catastrophising - CERQ	0.685	0.654
Perspective taking - CERQ	0.698	0.837
Other-blame - CERQ	0.763	0.685
Self-blame - CERQ	0.880	0.809
BPFS-C Total	0.794	0.798
Affect instability – BPFS-C	0.505	0.561
ID problem – BPFS-C	0.431	0.408
Negative relationship – BPFS-C	0.607	0.533
Self-harm – BPFS-C	0.773	0.804
ITE-Personal	0.875	0.821
ITE-General	0.798	0.645
Flow-fluency	0.811	0.655
Flow-absorption	0.270	-0.274
Flow-Total	0.777	0.706

Appendix 16: Participant Flow Chart



Appendix 17: Spearman Rank correlations for all variables at Time 1 and Time 2

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1.Self-blame	-	0.410	0.606**	-0.733***	-0.512*	-0.549*	-0.332	0.132	-0.432	0.135	0.072	0.348	-0.130	0.142	0.201
2. Acceptance	0.207	-	0.192	-0.053	-0.019	-0.054	0.163	0.288	-0.271	0.341	0.249	0.316	-0.161	0.212	0.093
3. Rumination	0.298	0.100	-	-0.630**	-0.535*	-0.596**	-0.412	0.340	0.059	0.189	0.007	0.364	0.246	-0.071	0.113
4. Positive refocus	-0.504**	-0.056	-0.420*	-	0.756***	0.890***	0.723***	0.023	0.231	-0.092	-0.053	-0.592**	0.215	0.078	-0.035
5. Refocus planning	-0.476**	0.091	-0.139	0534**	-	0.730***	0.699**	-0.176	0.146	-0.482*	0.002	-0.754***	0.094	0.399	-0.157
6.Cognitive reappraisal	-0.472**	-0.08	-0.384*	0.795**	0.732***	-	0.830***	0.036	0.130	-0.054-	0.101	-0.593**	-0.017	0.106	0.071
7. Perspective	-0.044	0.176	-0.108	0.546**	0.301	0.545**	-	-0.073	-0.224	-0.212	-0.140	-0.504*	0.034	0.403	0.057
8. Catastrophising	0.149	0.175	0.577**	-0.379*	0.041	-0.211	-0.427*	-	0.456	0.149	-0.185	0.096	0.334	-0.471*	0.356
9. Other blame	-0.503**	-0.268	0.031	0.262	0.262	0.322	0.125	0.013	-	-0.075	0.039	-0.227	0.574	-0.467	-0.138
10. BPD traits	0.238	0.078	0.354	-0.311	-0.428*	-0.477**	-0.158	0.270	-0.121	-	0.164	0.580*	-0.190	0.172	0.339
11. Implicit beliefs – General	0.124	-0.014	-0.029	-0.408*	-0.251	-0.262	-0.297	-0.078	-0.312	0.233	-	0.042	0.114	0.264	-0.196
12. Implicit beliefs – personal	0.183	0.195	0.381*	-0.730***	-0.551**	-0.724***	-0.532**	0.265	-0.149	0.435*	0.453*	-	-0.430	-0.177	0.156
13. Flow	-0.403*	-0.102	0.187	0.332	0.605***	0.441*	0.179	0.060	0.364	-0.313	-0.342	-0.251	-	-0.393	-0.573
14. Age	0.243	0.180	-0.022	0.026	0.191	0.187	0.231	-0.028	-0.175	0.112	0.360	-0.230	-0.249	-	0.153
15. Gender	0.284	0.078	0.066	-0.115	-0.153	-0.184	-0.110	0.177	-0.191	0.235	-0.149	0.011	-0.184	0.190	-

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

Time 1 below the diagonal and Time 2 above the diagonal