

**Exploring the Role of Psychological Factors in the Relationship between
Attachment and Suicidal Thoughts and Behaviours**

A thesis submitted to the University of Manchester for the degree of

Doctor of Clinical Psychology

in the Faculty of Biology, Medicine and Health

2018

JESSICA A. GREEN

Division of Psychology and Mental Health

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Abstract

Exploring the Role of Psychological Factors in the Relationship between Attachment and Suicidal Thoughts and Behaviours

Approximately 800, 000 people die by suicide every year. Moreover, for every fatal outcome approximately 20 people attempt to take their own life. Therefore, increasing our understanding of the vulnerability factors and acute states that trigger suicide and related behaviours is vital in improving suicide prevention efforts and initiatives. This thesis aims to contribute to the evidence base by examining attachment in relation to suicide-related outcomes and, specifically, the role of psychological mechanisms in this relationship.

Paper one is a systematic review of quantitative empirical research investigating the role of psychosocial mechanisms in the attachment-suicide relationship. Fifteen papers were identified, most of which carried out mediation analyses. Studies were extremely heterogeneous and there was limited overlap with respect to the psychological mechanisms under investigation. However, there is preliminary evidence that suggests a range of predisposing, precipitating and crisis-state factors mediate the association between attachment styles and suicidality. Studies were critically evaluated and findings were discussed in the context of a developmental model of suicide. Areas for further exploration are considered and clinical implications discussed.

Paper two is an original empirical study investigating the mediating role of reflective functioning between adult attachment and suicidality. Sixty-seven participants completed self-report questionnaires measuring adult attachment, suicidal ideation, reflective functioning, depressive symptoms and hopelessness. Mediation analyses did not support an indirect effect of either attachment dimension on suicidal ideation via mentalization impairments. However, a direct relationship was established between avoidant attachment and suicidal ideation. Findings are considered in light of the limitations and cross-sectional methodology. Future research directions are recommended, and clinical implications outlined.

Paper three is a critical reflection that aims to provide insight and reflections on the research process. Explanations and justifications of key decisions are offered, and reflections are made in respect to the study design, methodology, recruitment, data analysis and personal experiences of the researcher.

Declaration

No portion of the work referred to in the thesis has been submitted in support of an application for another degree or qualification of this or any other university or other institute of learning.

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Acknowledgements

Foremost, I would like to thank my research supervisors, Dr. Daniel Pratt, Dr. Katherine Berry, and Dr. Adam Danquah, for their unwavering support and encouragement. Without their expertise and guidance, the current thesis would not have been achievable.

The empirical research would not have been possible without the sixty-seven individuals who gave up their time to participate, and I feel incredibly fortunate that I got to hear their personal experiences. I would also like to acknowledge every clinician who supported the recruitment process and helped identify eligible participants.

I would also like to thank my peers on the Clinical Psychology Doctoral Programme (2015 intake) for their support and friendship over the past three years. I particularly want to acknowledge Holly Turton; my co-researcher and good friend. I am incredibly grateful that I was given the opportunity to carry out a joint project with another trainee, and cannot imagine underdoing this process without her support, advice and daily debriefing sessions.

Finally, I must thank my family, friends and my partner Laurence. They have been exceptionally supportive, kind and tolerant throughout this process. I would not have made it through the past three years without the abundance of home cooked meals and their words of encouragement.

Paper One: The Role of Psychological and Social Factors in the Relationship between Attachment and Suicidality: a Systematic Review

Paper one is a systematic review of the literature that has examined the role of psychosocial variables in the relationship between attachment and suicide-related outcomes. To the authors' knowledge, no published review has focused on the role of mediators and/or moderators in this relationship. The review is relevant to paper two which explores the role of Reflective Functioning as a mediator between adult attachment and suicidal ideation.

This paper has been prepared for submission to Clinical Psychology Review in accordance to the journal guidance for authors (appendix A). As instructed in the author guidelines, the manuscript has been prepared and formatted per the guidelines set forth in the Publication Manual of the American Psychological Association (6th Edition).

The author guidelines state that ordinarily the full manuscript should not exceed 50 pages. However, due to the margin requirements for thesis submission means this has been exceeded. This will be rectified upon submission.

Main Text Word Count: 12,792 (excluding abstract, tables, figures, bibliography and appendices):

**The Role of Psychological and Social Factors in the Relationship between
Attachment and Suicide: A Systematic Review**

Jessica Green

Division of Psychology and Mental Health
Faculty of Biology, Medicine and Health
University of Manchester

Author Note

This research was submitted to the University of Manchester for the degree of Doctor of
Clinical Psychology (ClinPsyD)

Corresponding Author:

Jessica Green
Trainee Psychologist
Faculty of Biology, Medicine and Health
The University of Manchester
2.01 2nd Floor Zochonis Building
Brunswick Street
Manchester
M13 9PL

Tel: +44 (0) 161 306 0400

Email: jessica.green@postgrad.manchester.ac.uk

Abstract

Insecure attachment is widely accepted to be a general risk factor for suicidal thoughts and behaviours. To increase our understanding of this distal association, the current systematic review aimed to evaluate empirical evidence that has investigated the role of psychosocial mechanisms in this relationship. Fifteen original research articles were identified, with the majority carrying out mediational analyses to test their hypotheses. Substantial heterogeneity was found across studies with regards to their theoretical approach to assessing attachment, suicide-related outcomes, sample population, statistical analyses and the psychological factors under investigation. Nevertheless, this emergent evidence base indicates that a range of predisposing, precipitating and crisis-state factors may mediate the association between attachment styles and suicidality. Studies which investigated moderating factors did not produce significant findings, and the mediating role for psychiatric diagnoses remains unclear. Furthermore, this emerging research base is limited by an over-reliance on cross-sectional designs and self-report data. Longitudinal and experimental designs are required to verify causal pathways, and to investigate whether trait vulnerabilities interact with acute stressors to increase suicide risk. Finally, disorganised attachment has been overlooked so far and should be given greater consideration going forward.

Highlights

- A general relationship has been established between attachment and suicidality
- Fifteen original studies were identified by the current systematic review
- Findings indicate that several psychological factors mediate this relationship
- Most studies were cross-sectional and therefore causality cannot be inferred
- Longitudinal research that also examines disorganised attachment is now required

Keywords

Attachment, Suicide, Psychological Models, Mediation, Moderation

Introduction

Each year, approximately 804, 000 people die by suicide, making it the leading cause of death worldwide among 15-29 year olds (World Health Organisation, 2018). Moreover, for every fatal outcome approximately 20 people attempt to take their own life, and a prior suicide attempt is the biggest risk factor for future suicide (World Health Organisation, 2014). Therefore, increasing our understanding of the vulnerability factors and acute states that trigger suicide and related behaviours is vital in improving suicide prevention efforts and initiatives.

Psychological Models of Suicide

Suicide is the fatal act of an individual intentionally ending their own life (O'Connor & Nock, 2014), whereas the terms suicidality or suicide-related behaviour are used more generally and encompass suicidal ideations, urges, plans, attempts and fatal outcomes (Silverman, Berman, Sanddal, O'Carroll, & Joiner, 2007). Suicide results from the complex interplay of many risk factors, including sociodemographic variables, personality and individual differences, cognitive and social factors, and negative life events (O'Connor & Nock, 2014). Psychological models of suicide have been developed to provide theoretical frameworks of how these multiple factors interact to increase risk, and to help identify modifiable targets for psychological intervention. Most contemporary models are diathesis-stress theories with a cognitive-behavioural focus, that conceptualise suicide as the outcome of pre-existing vulnerability factors being activated by acute stress (Johnson, Gooding, & Tarrier, 2008; Mann, Waternaux, Haas, & Malone, 1999; O'Connor, 2011; Schotte & Clum, 1987; Wenzel & Beck, 2008; Williams, 1997). Other explanations have emphasised the role of social connectedness, for example the Interpersonal-Psychological Theory of Suicidal Behaviour (IPT; Joiner, 2005; Van Orden et al., 2010) suggests that social alienation (thwarted belongingness) contributes to

individuals developing suicidal desires when combined with feelings of burdensomeness. Yet, although contemporary psychological theories of suicide have been developed since the mid-1980s, few have focused on social developmental concepts such as Attachment Theory (Bowlby, 1969).

Attachment Theory

As humans, we are biologically predisposed to display attachment behaviours; interpersonal actions that increase our sense of felt security in times of stress or need (Bowlby, 1969). These behaviours are particularly prevalent in childhood when infants rely on their primary caregivers for survival. Children who are responded to consistently and appropriately tend to develop a secure attachment style and thrive in areas of emotional, social and physical development. However, those who experience insensitive, inconsistent or abusive parenting are more likely to develop an insecure attachment style, and internalise beliefs that others are unpredictable and unreliable. These internal working models serve as a blueprint for future relationships, and translate into similar styles of relating in the context of adult romantic relationships (Hazan & Shaver, 1987)

There are many different theoretical approaches to classifying and measuring attachment (see Ravitz, Maunder, Hunter, Sthankiya, & Lancee, 2010 for an overview of adult measures). Instruments tend to assign individuals to categories based on their hypothesised attachment style, or rate individuals on dimensions of attachment using continuous measures. Two dimensions that are widely recognised in both infants and adults are avoidance and anxiety (Ainsworth, Bell, & Stayton, 1971; Ainsworth, Blehar, Waters, & Wall, 1978; Hazan & Shaver, 1987). Individuals high in attachment avoidance are uncomfortable with closeness in relationships and over-value independence, whereas those high in attachment anxiety strongly desire close relationships yet have an intense fear of abandonment. Those who score low on both dimensions are thought to be securely

attached; they feel close to significant others and can rely on them in times of need. Bartholomew and Horowitz (1991) aimed to reconcile categorical and dimensional approaches by defining four categories that correspond to the possible combinations of avoidant and anxious attachment. Depending on whether adults view themselves and others as positive or negative, they are categorised as either secure (low avoidance, low anxiety) or one of three 'insecure' categories; preoccupied (high anxiety, low avoidance) dismissing (low anxiety, high avoidance) or fearful (high anxiety, high avoidance). Regardless of approach, an insecure attachment style has been established as a general risk factor for psychopathology (Mickelson, Kessler, & Shaver, 1997), which may extend to suicidal thoughts and behaviours.

A Developmental Model of Attachment and Suicide

The idea that attachment difficulties may underpin suicidal behaviour can be traced back to early psychoanalytic and object relations theorists, who viewed suicide as a problem of internal object relations and aggression stemming from developmental difficulties early in childhood (Freud, 1957; Klein, 1935). However, it was not until the mid-1990s that a causal model for suicidal behaviour was proposed from an attachment perspective. Adams (1994) conceptualised suicidal behaviour as a manifestation of pathological attachment behaviour later in life, and argued that the attachment paradigm may serve as a suitable framework for understanding suicide.

In brief, Adams (1994) suggested that adverse parenting and negative early attachment experiences are predisposing factors for later suicidal behaviour. The model outlines how this distal relationship is mediated through internalised working models of self and attachment figures, and resultant trait variations in self-worth, emotional regulation skills and interpersonal capabilities. People with a secure attachment style hold more positive representations of themselves and others. In turn, this increases their

resiliency and their capacity to contain and manage distress when faced with interpersonal difficulties. In contrast, people with an insecure attachment style develop trait vulnerabilities such as low self-esteem, relationship difficulties and pessimism. When these vulnerabilities are coupled with acute loss, rejection and disappointment, an unmanageable attachment crisis is triggered. Insecure individuals respond with immobilising anxiety, anger and hopelessness – like those behaviours exhibited by children following separation– eventually cumulating in suicidal thoughts and actions (Fig. 1).

Adams (1994) also speculated on whether the severity of ensuing suicidal behaviour may depend on the specific nature of an individual's internal working model and the responsiveness of significant others. He hypothesised that moderately insecure individuals may display suicidal threats and gestures that are predominantly interpersonal, and motivated by an urgent yet hopeful appeal for care. Alternatively, individuals who hold stronger and more negative representations of both themselves and others may display more despairing and potentially lethal suicidal behaviour. In his original conceptualisation Adams (1994) did not refer to the attachment styles or dimensions that are commonplace in the contemporary literature. However, as these styles are due to variations in internal working models, it is logical that individuals high in anxious attachment may display different suicidal behaviour than those high in avoidance.

Empirical Support

Since the development of Adams' (1994) model, empirical research has reliably demonstrated that individuals reporting an insecure attachment style are at an increased risk of a variety of suicide-related outcomes. In a nationally representative sample, Palitsky, Mota, Afifi, Downs, and Sareen (2013) found that after adjusting for

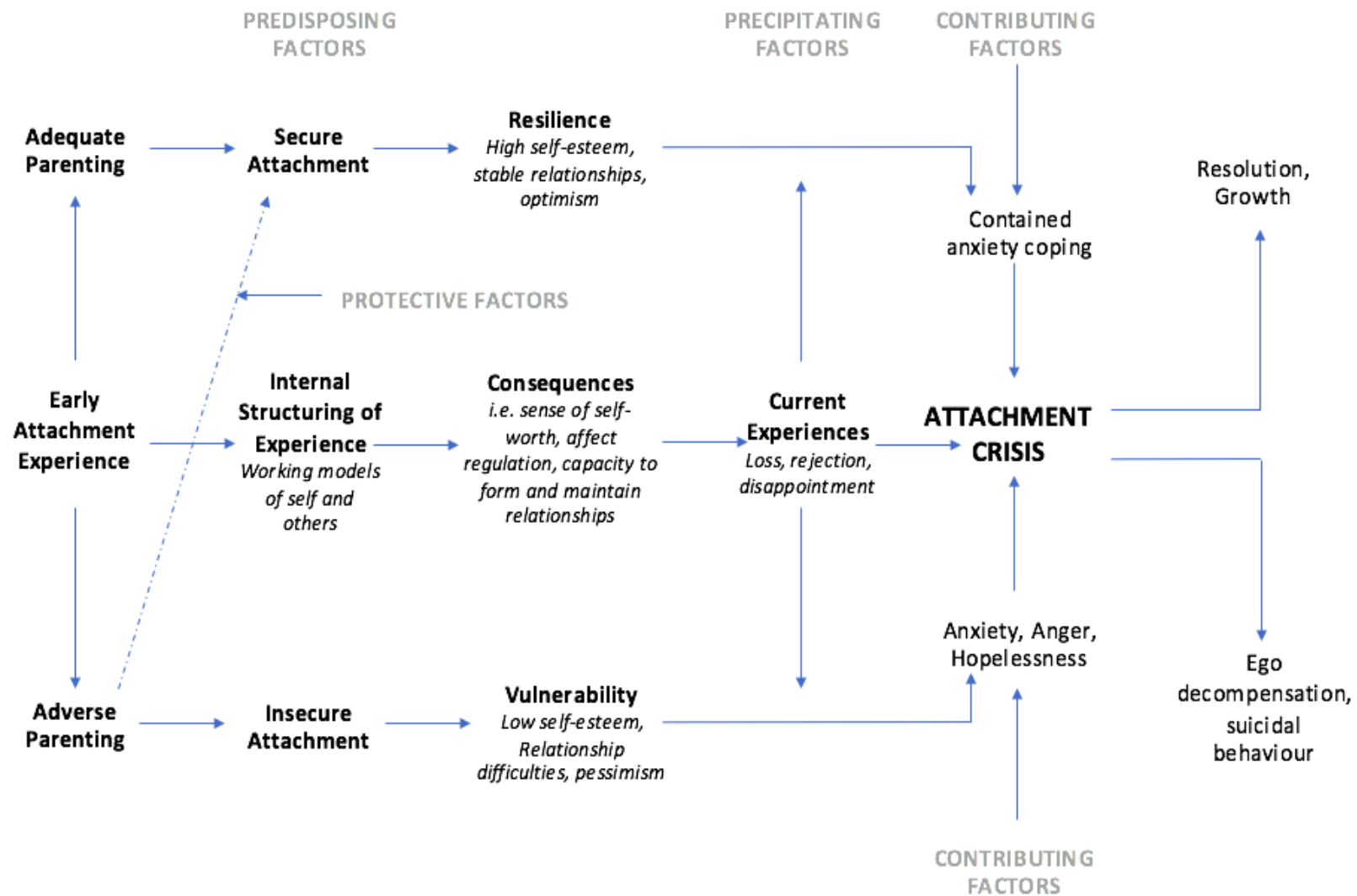


Fig. 1. Developmental Model of Suicidal Behaviour (adapted from Adams, 1994)

sociodemographic variables, mental health diagnoses and childhood adversity, insecure attachment remained significantly associated with an increased likelihood of reporting suicidal ideation and attempts. Similar findings have also been reported from research with adolescent (Adams, Sheldon-Keller, & West, 1996; Lessard & Moretti, 1998; Sheftall, Mathias, Furr, & Dougherty, 2013), and adult psychiatric samples (Grunebaum et al., 2010; Lizardi et al., 2011; Stepp et al., 2008). Anxious attachment styles (including fearful and preoccupied classifications) have been found to associate with increased suicidal ideation (Lessard & Moretti, 1998; Riggs & Jacobvitz, 2002) and attempts (Adams et al., 1996; Stepp et al., 2008; Zeyrek, 2009). However, Grunebaum et al. (2010) only found significant effects for avoidant, and not anxious, attachment styles, whereas Levi-Belz, Gvion, Horesh, and Apter (2013) showed both subtypes predicted lethality of suicide attempts.

Approximately 40% of adults are estimated to have an insecure attachment style (Mickelson et al., 1997), and so not everybody with an insecure attachment considers or engages in suicidal behaviour. Therefore, we need to verify the key psychological mechanisms that underpin the relationship between attachment insecurity and suicidal behaviour so that psychological interventions can be developed to target these specific factors and subsequently reduce risk. Miniati, Callari, and Pini (2017) reviewed literature published up until 2013 that examined adult attachment and suicidality, and hypothesised that biological and psychiatric factors may play an important role in the relationship. Whilst psychopathology is undoubtedly important as many individuals who attempt suicide have a psychiatric diagnosis (O'Connor & Nock, 2014), this previous review overlooked the potential importance of psychosocial mechanisms such as personality differences, and cognitive, social and interpersonal factors.

Review Aims

In the past decade, several studies have investigated the explanatory role of psychosocial variables in the attachment-suicide relationship. However, to the authors' knowledge there have been no systematic efforts to synthesise this literature. Therefore, the primary aim of the current systematic review was to evaluate literature that has examined moderating or mediating psychosocial factors in the relationship between attachment styles and suicidality. Furthermore, due to the developing nature of this topic, a secondary aim of this review was to consider the methodological strengths and limitations of the published research to inform suggestions for future research.

Method

The protocol was pre-registered and available on the PROSPERO data repository website: <http://www.crd.york.ac.uk/PROSPERO> registration number: CRD42017060891.

Eligibility Criteria

The aim of the current review was to examine the role of psychosocial variables in the relationship between attachment security and suicidality. Therefore, eligible papers had to include:

1. A self-report, interview or observational measure of attachment. Instruments that only assessed conceptually-related constructs such as parental bonding or family functioning were not considered valid measures of attachment style or security.
2. A measure of suicidality including suicidal ideation, plans, threats and fatal or non-fatal attempts. Studies that measured self-injurious thoughts or behaviour with no suicidal motive or intent (i.e. non-suicidal self-injury), or where intent to end life could not be inferred from the study report, were excluded.
3. A measure of one or more additional psychological or psychosocial factors including measures of cognitions, emotions, metacognitions, psychosocial factors, risk

behaviours or measures of psychological symptoms (e.g. depression, anxiety).

Sociodemographic factors that are not amenable to psychological intervention (e.g. age, gender, ethnicity, socioeconomic status) were not considered sufficient.

4. Statistical analysis exploring the role of intervening variables in the relationship between attachment and suicidality. In quantitative work this is most commonly demonstrated with pathway, mediation or moderation analyses.

Furthermore, articles had to report original, empirical findings and be published in a peer-reviewed academic journal. Therefore, literature reviews, editorials, opinion / position papers, practice recommendations, purely theoretical papers, book chapters, conference abstracts and dissertations were automatically excluded. Articles published before 1980 were also automatically excluded as the first measures of attachment were not developed until the 1980s. Quantitative research papers with a cross-sectional, case-control or cohort design were eligible, whereas qualitative research and case studies or case series were excluded.

Search Strategy

Fig. 2 illustrates the study selection process. To be comprehensive and inclusive, the initial search sought any empirical studies that examined the relationship between attachment security and suicidal thoughts and/or behaviours. Four electronic databases (EMBASE, PsycINFO, PubMed and Web of Science (incorporating MEDLINE)) were searched up until October 2017 using combinations of text keywords, MeSH terms or Subject Headings tailored to each electronic database (Appendix B). Filters were used to limit search results to English Language, although a small number of non-English language articles were identified at the screening stage.

Initially, the first author screened all titles and abstracts of identified articles after the electronic removal of duplicates ($n = 4365$). A second independent peer screened 10%

of the titles and abstracts to provide a measure of inter-rater reliability. Cohen's κ was calculated to measure the proportion of agreement between the two raters over and above that expected by chance, and there was substantial agreement between the two raters ($\kappa = .61, p < .001$).

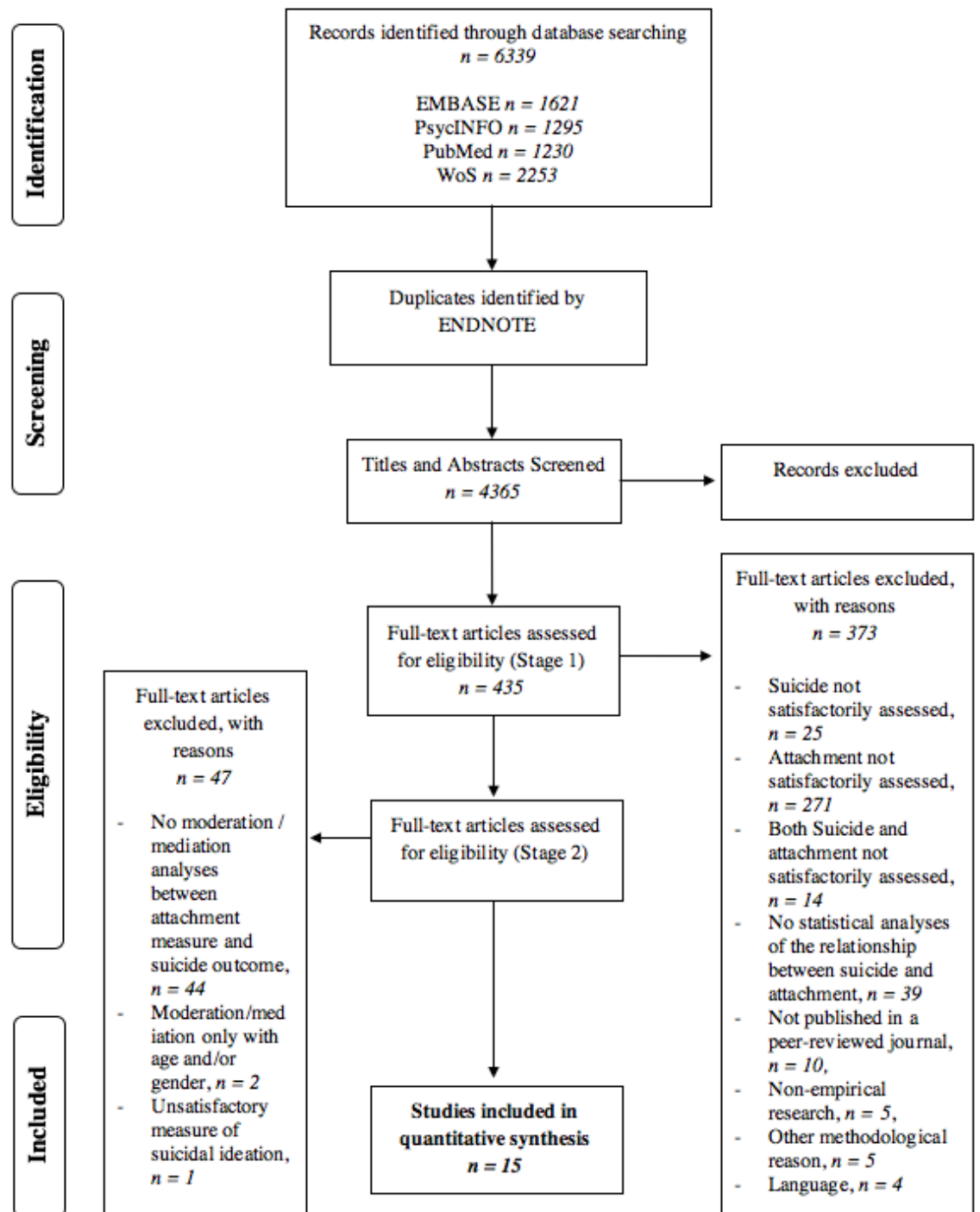


Fig. 2. PRISMA flow diagram illustrating the process of literature searches and screening

Examining the results of the cross-tabulation revealed that all but one discrepancy was due to the first author being overly inclusive rather than screening out potentially relevant papers. Therefore, whilst this led to the main reviewer screening more full texts than perhaps necessary, it is unlikely that any key papers were missed. Next, the full text of those papers identified as potentially relevant were reviewed for eligibility. Only studies that examined the role of one or more psychosocial variables in the relationship between an attachment measure and suicidal outcome were included in the final review. Any uncertainty regarding paper inclusion at the full-text screening stage was discussed and resolved between the research team.

Quality Assessment

Eligible papers were evaluated for methodological quality using a National Institute for Health Quality Assessment Tool for Assessing the Quality of Observational Cohort and Cross-Sectional Studies (Appendix C; National Institute for Health, n.d.). The assessment tool consists of 14 individual criteria that can be rated as yes, no, cannot determine, not reported, or not applicable. The questions are designed to facilitate critical appraisal of observational research and help the reviewer consider areas of potential bias, rather than to produce a score that can be classified as poor, fair or good. However, to give an indication of quality and allow for between-study comparison a percentage of how many applicable criteria were given affirmative ratings was calculated, accompanied by an overview of the key areas of bias below.

Terminology

Consistent terminology will be used throughout the review. Self-harm encompasses all intentional self-poisoning or self-injury, irrespective of motive or the extent of suicidal intent. The term *suicidality* will be used generally to refer to self-injurious thoughts or behaviours where an individual considers, or takes actions towards, intentionally taking their own life. This encompasses the more specific outcomes of *suicide*, which refers to deliberate, self-injurious behaviour with a fatal outcome, in which

there was at least some degree of suicidal intent. *Attempted suicide* or a *suicide attempt* refers to non-fatal self-injurious behaviour, again in which there was at least some intention of dying because of the behaviour. *Suicidal ideation* is where an individual has thoughts about intentionally taking their own life, and these thoughts can vary in terms of frequency, intensity and whether an individual intends to act upon them. *Suicide-related communications* include both *suicide threats*; a verbal or non-verbal communication without a direct self-injurious component that would lead to another person to interpret that suicide might occur soon, and a *suicide plan*; the formulation of a specific strategy that has the potential for resulting in a self-injurious outcome and may include proposed methods for carrying out the programme of action. Self-harm without suicidal intent will be referred to as non-suicidal self-injury (NSSI). Studies that explicitly examined NSSI were not included in the review and therefore this terminology will not be encountered as frequently.

Results

Overview of Studies

The systematic literature search yielded fifteen original research articles that investigated the role of psychosocial variables in the relationship between attachment security and suicidality. Key characteristics of the studies are summarised in Table 1.

Sample characteristics. Ten studies were undertaken in North America, three originated from the Middle East (2 Iran, 1 Israel) and two from European Countries (France, Italy). A total of 4,347 people participated with samples sizes ranging from 74 to 766. Eleven studies sampled predominantly adults; two did not report the age of the youngest participant but sampled college students with a mean age of 19.5 and 19.9 years (Langhinrichsen-Rohling, Thompson, Selwyn, Finnegan, & Misra, 2017; Strang &

Table 1 Study Characteristics and Main Findings

Study	Title	Country	Sample Characteristics	Design	Attachment Measure	Suicide-related Outcome Measure	Mediator / Moderator Measure	Findings	Quality Rating
Cohen, Ardalan, Yaseen, and Galyunker (2017)	Suicide Crisis Syndrome Mediates the Relationship Between Long-term risk factors and Lifetime Suicidal Phenomena	USA	207 psychiatric inpatients (66.2% female). Age (M = 36.62, SD = 13.8). Mood or psychotic disorder diagnosis.	Cross-sectional	Fearful attachment only. Relationship Scales Questionnaire (Griffin & Bartholomew, 1994).	Lifetime suicidal ideation and behaviour. A single score of lifetime severity calculated (0-9). Columbia Suicide-Severity Rating Scale (C-SSRS; Posner et al., 2011) Pre-admission Suicidal Ideation and Attempt. Obtained from electronic medical record.	Suicide Crisis Syndrome (SCS); a hyper aroused negative affect state driven by a feeling of entrapment. Suicide Trigger Scale – 3 (STS-3; Yaseen et al., 2014).	The SCS was found to be a partial mediator of the relationship between fearful attachment and lifetime suicidal phenomena.	41.6
Falgares et al. (2017)	Attachment Styles and Suicide-related Behaviours in Adolescence: the mediating role of self-criticism and dependency	Italy	340 high school students (73.2% female), 13-20 years (M = 16.47, SD = 1.52).	Cross-sectional	Anxiety and Avoidance Attachment Style Questionnaire – Italian Version (ASQ; Fossati et al., 2003).	Lifetime suicide ideation and attempts. Suicide Behaviours Questionnaire – Revised (SBQ-R; Osman et al., 2001)	Self-criticism, Dependency. Depressive Experiences Questionnaire for Adolescents (DEQ-A; Sidney J Blatt, Schaffer, Bers, & Quinlan, 1992). Self-criticism and Dependency sub-scales only.	The indirect effects of attachment anxiety on suicidal behaviours through both greater self-criticism and lower dependency were significant. For avoidant attachment, only self-criticism was found to be a significant mediator.	50.0
Gormley and McNeil (2010)	Adult Attachment Orientations, Depressive Symptoms, Anger, and Self-directed aggression by psychiatric patients.	USA	109 psychiatric inpatients (41% female), age 18-84 (M = 40.7 years, SD = 13.6). Various Diagnoses.	Cross-sectional	Anxiety and Avoidance The Relationship Questionnaire (RQ; Bartholomew & Horowitz, 1991) Adapted 12 item version.	Suicide Attempt. Single item ‘Since age 12, have you tried to commit suicide’.	Depressive Symptoms. Beck Depression Inventory (Beck, Steer, & Carbin, 1988)	Participants with higher levels of attachment anxiety were significantly more likely to report a history of suicide attempts. Attachment avoidance was not a significant indicator. Depression symptoms were found to partially mediate the relationship between attachment anxiety and suicide attempt history.	33.3

Table 1 Study Characteristics and Main Findings (Continued)

Study	Title	Country	Sample Characteristics	Design	Attachment Measure	Suicide-related Outcome Measure	Mediator / Moderator Measure	Findings	Quality Rating
Heydari, Teymoori, and Nasiri (2015)	The effect of Parent and Peer attachment on suicidality: the mediation effect of self-control and anomie	Iran	336 University Students (54.2% female), Aged 18-29 (M = 21.9, SD = 2.38).	Cross-sectional	Father, Mother and Peer Attachment. Attachment Scale (Özbay & Özcan, 2006) adapted to measure father, mother and peer attachments.	Suicidal Ideation. 5-items scored on a Likert Scale, with higher scores indicating greater ideation.	Anomie. A state where social cohesion and bonds break down. Anomie scale (Pourafkari, Hakilmi, Heydari, & Froutan Kia, 2012). Self-control. Self-control scale (Cheung & Cheung, 2008).	Mother and peer attachment were found to have a significant indirect effect on suicidality, via self-control and anomie. Self-control was also found to have an indirect effect on suicide ideation via anomie.	25.0
S. Kidd and G. Shahr (2008)	Resilience in Homeless Youth: The Key Role of Self-esteem	USA, Canada	208 homeless youth (40% female), 14-25 years (M = 20.25, SD = 2.39).	Cross-sectional	Secure, Dismissing, Fearful and Preoccupied. The Relationship Questionnaire (RQ; Bartholomew & Horowitz, 1991)	Suicidal Ideation. 4-item scale of items related to suicidal thoughts and plans.	Self-esteem. Rosenberg self-esteem Scale (Rosenberg, 1989) - abridged version (5 items).	Fearful attachment and self-esteem were significantly correlated with suicidal ideation, and secure attachment negatively correlated. However, no statistically significant interaction between fearful attachment and self-esteem on suicidal ideation was found.	58.3
Langhinrichsen-Rohling et al. (2017)	Maladaptive schemas mediate poor parental attachment and suicidality in college students	USA	766 students (70% female). Mean age 19.9 years (SD = 3.7 years).	Cross-sectional	Parent Attachment. Inventory of Parent and Peer Attachment (IPPA; Armsden & Greenberg, 1987) - Parent scale only.	Suicide Ideation. Suicide Ideation Questionnaire (SIQ; Reynolds, 1987).	Maladaptive Schemas. Abandonment, defectiveness, self-sacrifice, emotional deprivation and unrelenting standards. Young's Schema Questionnaire - Short Form (Young, 1998).	Good parental attachment was negatively related to suicide ideation and maladaptive self-schemas. Mediation analyses demonstrated a significant indirect effect of parental attachment on suicide ideation via maladaptive schemas.	41.6

Table 1 Study Characteristics and Main Findings (Continued)

Study	Title	Country	Sample Characteristics	Design	Attachment Measure	Suicide-related Outcome Measure	Mediator / Moderator Measure	Findings	Quality Rating
Levi-Belz et al. (2013)	Attachment Patterns in Medically Serious Suicide Attempts: The mediating role of self-disclosure and loneliness	Israel	102 consecutive patients (52% female) admitted following a suicide attempt. 35 medically serious suicide attempters (MSSA; Mean age = 39.7, SD = 15.3) vs. 67 medically non-serious suicide attempters (MNSSA; M = 37.3, SD = 14.0).	Cross-sectional	Anxiety and Avoidance. Experiences in Close Relationships Scale (ECR; Brennan, Clark, & Shaver, 1998).	Suicide attempt lethality. The Lethality Rating Scale (Beck, Beck, & Kovacs, 1975).	Self-disclosure. Jourard Self-Disclosure Questionnaire (Jourard, 1971). Loneliness. UCLA Loneliness Scale (Russell, Peplau, & Cutrona, 1980).	Anxious and avoidant attachment were associated with medical lethality of suicide attempts. Self-disclosure mediated the effect of avoidant attachment on medical lethality. Loneliness mediated the effect of both attachment patterns on medical lethality.	50.0
Li et al. (2017)	Attachment style and suicide behaviours in high risk psychiatric inpatients following hospital discharge: the mediating role of entrapment	USA	200 psychiatric inpatients (53.5% female), 18-65 years (M = 35.4 years, SD = 13.4). Discharge assessment (n=137), Follow-up assessment (n=85).	Longitudinal	Fearful, dismissing, preoccupied and secure. Relationship Scales Questionnaire (Griffin & Bartholomew, 1994).	Suicide behaviour at follow-up. Any actual, aborted or interrupted suicide attempt 1-2 months' post-discharge. Columbia Suicide-Severity Rating Scale (C-SSRS; Posner et al., 2011).	Entrapment. Suicide Crisis Inventory – Entrapment subscale. (Galynker et al., 2017)	Only fearful attachment was significantly associated with suicide behaviour after discharge. Perceived entrapment at discharge was found to significantly mediate the relationship between fearful attachment and post-discharge suicidal behaviour.	64.3
Lizardi et al. (2011)	The effect of social adjustment and attachment style on suicidal behaviour	USA	524 patients (59.7% female), 18 - 75 years (M = 37.0 years, SD = 13.3) Major Depressive Episode (Unipolar or Bipolar)	Cross-sectional.	Anxious and Avoidant. Adult Attachment Scale (Simpson, 1990)	Suicide attempt history. Columbia Suicide History Form (Oquendo, Halberstam, & Mann, 2003).	Social Adjustment. Social Adjustment Self-Report Scale (SAS-SRWeissman & Bothwell, 1976)	Only anxious attachment and work adjustment were statistically different between attempters and non-attempters. There was no interaction effect between anxious attachment and work adjustment with suicide attempts.	58.3

Table 1 Study Characteristics and Main Findings (Continued)

Study	Title	Country	Sample Characteristics	Design	Attachment Measure	Suicide-related Outcome Measure	Mediator / Moderator Measure	Findings	Quality Rating
Rodgers et al. (2011)	An exploration of the role of defensive psychopathology in adolescent suicidal ideation and behaviour	France	615 students (38% female), aged 14 - 21 years (Male M = 16.8, SD = 1.3, Female M = 17, SD = 1.3).	Cross-sectional	Parent Attachment. Inventory of Parent and Peer Attachment (IPPA; Armsden & Greenberg, 1987) - Parent scale only.	Suicide Ideation and attempts. Suicide Behaviours Questionnaire – Revised (SBQ-R; Osman et al., 2001).	Defensive Psychopathology. Borderline Personality disorder scale of the Personality Diagnostic Questionnaire, Fourth Edition (PDQ-4; Hyler, 1994). Cannabis and alcohol use assessed with a 9-point rating scale ranging from 0 (no use) to 8 (multiple times per day). Adolescent Dissociative Experiences Scale (Armstrong, Putnam, Carlson, Libero, & Smith, 1997). Depression. Centre for Epidemiologic Studies - Depression Scale (Andresen, Malmgren, Carter, & Patrick, 1994)-short version.	Both depression and defensive psychopathology were found to fully mediate the relationship between parental attachment and suicide ideation. For males, a direct relationship was found between depression and suicide ideation.	50.0
Stepp et al. (2008)	The Role of Attachment Styles and Interpersonal Problems in Suicide-related behaviours.	USA	406 patients (66.5% female). Mean age = 37.2 years (SD = 10.5). Various diagnoses; excluded psychotic disorders.	Cross-sectional	Anxious and Avoidant Attachment. Minimum of three, 2-hour interviews. Cluster analysis based on clinician ratings.	History of self-injurious behaviours. Participants classified into either None, SH only, SA only or SA+SH. Structured diagnostic interviews for Axis II disorders (SCID-II; First, Spitzer, Gibbon, & Williams, 1997)	Interpersonal Problems. Inventory of Interpersonal problems (IIP; Horowitz, Rosenberg, Baer, Ureño, & Villaseñor, 1988)	A significant indirect effect of higher anxious attachment on SH+SA through interpersonal sensitivity and interpersonal aggression. Indirect effect of higher anxious attachment through lack of sociability was also significant for the SA only group. For avoidant attachment, there was an indirect effect on SA only via lack of sociability.	46.2

Table 1 Study Characteristics and Main Findings (Continued)

Study	Title	Country	Sample Characteristics	Design	Attachment Measure	Suicide-related Outcome Measure	Mediator / Moderator Measure	Findings	Quality Rating
Strang and Orlofsky (1990)	Factors underlying suicidal ideation among college students: a test of Teicher and Jacobs' model	USA	191 college students (51.8% female), 21 years or younger (median age - 19.5 years).	Cross-sectional	Interpersonal Attachment. Inventory of Parent and Peer Attachment (IPPA; Armsden & Greenberg, 1987).	Suicidal Ideation. Scale for Suicide Ideators (Schotte & Clum, 1982).	Helplessness – external. Locus of Control Scale (Nowicki & Strickland, 1973). Hopelessness. Beck Hopelessness Scale (Beck, Weissman, Lester, & Trexler, 1974).	Security of interpersonal attachment was found to differentiate the three ideators groups, and the most extensive differentiation occurred on the attachment to parents' subscales. Significant differences among ideator groups was also found for helplessness and hopelessness. However, no interaction effects were significant.	41.6
Valikhani et al. (2018)	Examining the role of attachment styles and self-control in suicide ideation and death anxiety for patients receiving chemotherapy in Iran.	Iran	74 (63.5% female) cancer patients, 17 – 71 years (M = 41.40, SD = 12.86)	Cross Sectional	Secure, Ambivalent and Avoidant. Adults' Attachment Styles Questionnaire (Feeney, Noller, & Hanrahan, 1994)	Suicide Ideation. Sum of two items used to determine existence and intensity of suicide ideation	Self-control. Self-control Scale (Tangney, Baumeister, & Boone, 2004).	Ambivalent attachment was found to affect suicide ideation through self-control.	33.3
Venta et al. (2014)	Preliminary evidence that thoughts of thwarted belongingness mediate the relations between level of attachment insecurity and depression and suicide-related thoughts in inpatient adolescents.	USA	133 adolescent inpatients (64.7% female). Age 12-17 years (M = 14.69, SD = 1.478).	Cross-sectional	Maternal attachment. Security Scale (Kerns, Klepac, & Cole, 1996).	Suicide Ideation. Beck Depression Inventory - II (BDI-II; Beck, Steer, & Brown, 1996)- item 9.	Thwarted Belongingness and Perceived Burdensomeness. Interpersonal needs questionnaire (INQ; Van Orden, Witte, Gordon, Bender, & Joiner Jr, 2008)	Higher attachment security only correlated with thwarted belongingness. Thwarted belongingness was found to mediate the relationship between suicide-related thoughts and level of attachment security.	58.3

Orlofsky, 1990). A single study recruited 17-71 year olds and was also classified as a predominantly adult sample (Valikhani, Sarafraz, & Moghimi, 2018). Three studies used a mixed sample of adolescents and young adults ranging from 13-25 years (Falgares et al., 2017; S. Kidd & G. Shahar, 2008; Rodgers, van Leeuwen, Chabrol, & Leichsenring, 2011), and one study recruited a solely adolescent sample (Venta, Mellick, Schatte, & Sharp, 2014).

Participants were recruited from a variety of settings and included psychiatric and non-psychiatric populations. Four psychiatric samples were recruited exclusively from inpatient hospitals (Cohen et al., 2017; Gormley & McNiel, 2010; Li et al., 2017; Venta et al., 2014), three included a combination of inpatient and outpatients (Grunebaum et al., 2010; Lizardi et al., 2011; Stepp et al., 2008) and one recruited individuals who presented to hospital following a suicide attempt (Levi-Belz et al., 2013). Due to the emerging nature of the literature most clinical studies either did not discriminate based on psychiatric diagnosis (n=4), or only excluded individuals with psychotic psychopathology (Stepp et al., 2008; Venta et al., 2014). However, two studies focused their examination on patients with major depressive disorders (Grunebaum et al., 2010; Lizardi et al., 2011) and Cohen et al. (2017) only recruited participants with a mood or psychotic disorder.

Most of the non-clinical samples were high school or University students (Falgares et al., 2017; Heydari et al., 2015; Langhinrichsen-Rohling et al., 2017; Rodgers et al., 2011; Strang & Orlofsky, 1990); and these studies had the largest sample sizes ranging from 336 to 766 students. The two remaining non-clinical studies recruited homeless youths (Sean Kidd & Golan Shahar, 2008) and non-psychiatric cancer patients (Valikhani et al., 2018).

Attachment measurement. In total ten different measures of attachment were administered. Nearly all studies used a self-report questionnaire measure; only one used a consensus rating process based on interview data (Stepp et al., 2008).

Ten studies examined adult attachment using seven different assessment tools. Of the different conceptualisations of adult attachment, six studies adopted the two-dimensional model of anxious and avoidant attachment as their theoretical basis (Brennan et al., 1998), whilst three used Bartholomew and Horowitz (1991) four-factor model. One study of adult attachment used a three-subscale measure designed to capture secure, anxious-ambivalent and avoidant styles (Valikhani et al., 2018).

Five studies that sampled young adult and adolescent participants, measured attachment to parents or peers. Three used a version of the Inventory of Parent and Peer Attachment (Armsden & Greenberg, 1987), a questionnaire developed for older adolescents and young adults that measures current relationships with parents and peers on three dimensions (communication, trust and alienation). Strang and Orlofsky (1990) used both the parent and peer scales, whereas the other two studies assessed attachment to parents only (Langhinrichsen-Rohling et al., 2017; Rodgers et al., 2011). Heydari et al. (2015) adapted a measure used in previous research to measure attachment to mother, father and peers on a continuum from insecure to secure, and Venta et al. (2014) used a measure of maternal attachment security that provides a single score of total security.

Suicide measurement. A range of suicide-related outcomes were assessed across the fifteen studies using a variety of self-report measures and methods of assessment. Six studies focused on suicide-related ideations and/or communications, however only two used psychometrically validated measures; Langhinrichsen-Rohling et al. (2017) used the Suicide Ideation Questionnaire (SIQ; Reynolds, 1987) and Strang and Orlofsky (1990) used the Scale for Suicide Ideators (SSI; Schotte & Clum, 1982). The remaining four used

between one and five single-items to assess for the presence and/or degree of suicidal thinking and communications (Heydari et al., 2015; Johnson et al., 2008; S. Kidd & G. Shahar, 2008; Valikhani et al., 2018; Venta et al., 2014).

Three studies used a general measure that incorporated thoughts, communications and attempts to provide a score of overall suicidality. Cohen et al. (2017) assigned participants a score from 0-9 to reflect the severity of their lifetime 'suicidal phenomena' based on their responses to the Columbia Suicide-Severity Rating Scale (C-SSR; Posner et al., 2011). Falgares et al. (2017) and Rodgers et al. (2011) both administered the Suicide Behaviours Questionnaire – Revised (SBQ-R; Osman et al., 2001); a four-item scale which assesses lifetime, recent and potential future ideations and attempts.

The remaining six studies investigated suicide attempts using a range of self-report measures. The two prospective, longitudinal studies (Grunebaum et al., 2010; Li et al., 2017) assessed for suicide attempts during follow-up periods using items from the original Columbia Suicide History Form (CSHF; Oquendo et al., 2003) and the revised C-SSR (Posner et al., 2011). Three studies grouped participants based on their history of suicide attempts. Lizardi et al. (2011) used the CSHF to separate patients with major depression into those with a lifetime history of suicide attempts and those with no such history. Similarly, Stepp et al. (2008) classified participants into one of four groups based on their responses to the Structured Diagnostic Interview for Axis II disorders (SCID-II; First et al., 1997). Levi-Belz et al. (2013) recruited recent suicide attempters and grouped them based on the lethality of their attempt which was determined using the interviewer-administered Lethality Rating Scale (Beck et al., 1975). Only one study used a single-item question to determine the presence or absence of past attempts (Gormley & McNiel, 2010).

Risk of Bias

Most of the research studies satisfied less than half of the criteria outlined in the quality assessment tool (n=11), with a mean score 47%. Common methodological problems included lack of clarity or justification for sample size and how many eligible people participated, validity of measurement tools and issues inherent to cross-sectional research.

Only two studies adopted a longitudinal design with two or more data points (Grunebaum et al., 2010; Li et al., 2017). As would be expected, their methodological quality was found to be higher as they assessed attachment security prior to the outcome of interest (suicide attempts over the follow-up period), making causal inference more plausible. However, these studies were not without other limitations and areas for potential bias. Neither study included participants free from suicidality at baseline or reported whether assessors at follow-up were blinded to the attachment status of participants. Li et al. (2017) lost 57.5% of their participants to follow-up, limiting both the statistical power of the analysis and the generalisability of the findings due to the potential for attrition bias. Grunebaum et al. (2010) only included patients in their analysis who provided data at three time points, and only referenced in the discussion that participants were lost to follow up without giving any specific details. Although their final sample size was sufficiently powered (n=136), differential attrition between those with different attachment styles could have affected their results.

Most of the studies assessed attachment, suicidality and other psychological variables of interest at one time point using self-report questionnaires (n = 12). Whilst this limits the potential of bias regarding blinding of observer assessors, it results in several methodological concerns relating to cross-sectional designs. Namely, causality or the direction of relationships between attachment, suicidality and mediating or moderating

variables cannot be assumed. Furthermore, several studies did not control for any potential confounders, such as age, gender or current psychopathology (Cohen et al., 2017; Heydari et al., 2015; Langhinrichsen-Rohling et al., 2017; Strang & Orlofsky, 1990). Whilst it is impossible to account for all factors that may be associated with the variables of interest, failing to control or adjust for basic key confounders reduces confidence in the validity of any reported findings.

Another common area for concern was selection bias. Gormley and McNiel (2010) reported that over 50% of those participants deemed eligible to participate declined, and nine studies did not report this information. Without clarification on how many eligible participants agreed to participate we cannot be certain that the study sample adequately represents the target population.

None of the studies justified their choice of sample size, for example by reporting a power analysis or a widely accepted rule-of-thumb, and only two studies acknowledged this in their discussion (Li et al., 2017; Venta et al., 2014). Therefore, those studies with smaller samples may have been underpowered, increasing the probability of Type II error (Gormley & McNiel, 2010; Levi-Belz et al., 2013; Venta et al., 2014). Encouragingly, those studies that used statistical analyses that require larger samples (e.g. Structural Equation Modelling) recruited between 336 – 615 participants (Falgares et al., 2017; Heydari et al., 2015; Rodgers et al., 2011). Therefore, despite not explicitly justifying their sample size, these studies are likely to be sufficiently powered.

Finally, the validity of the measures used to assess attachment and suicidality was also an area for some concern. Most studies used an established, validated self-report measure of attachment, although some used adapted versions (Gormley & McNiel, 2010; S. Kidd & G. Shahar, 2008) or reported internal reliability statistics that were less than acceptable (Falgares et al., 2017). Again, most studies (n=11) used objective or

psychometrically validated measures of suicide, however four assessed for the presence of suicidal ideation or attempts using a small number of non-validated items (Gormley & McNiel, 2010; Heydari et al., 2015; Valikhani et al., 2018; Venta et al., 2014).

Psychological Processes between Attachment and Suicidality

There was much heterogeneity in the psychosocial variables investigated in the fifteen studies. Informed by Adams (1994) developmental model, variables were grouped into categories that approximately map onto the model; (i) *predisposing factors* that may infer vulnerability or resiliency, (ii) *precipitating factors* that may trigger an attachment crisis, (iii) internal mental pain states that may characterise or follow an attachment crisis, and (iv) *psychopathology*.

Predisposing Factors. Seven different variables measured across seven studies were categorised as ‘predisposing’ factors (Falgares et al., 2017; Heydari et al., 2015; S. Kidd & G. Shahar, 2008; Langhinrichsen-Rohling et al., 2017; Levi-Belz et al., 2013; Stepp et al., 2008; Valikhani et al., 2018). By this, we mean vulnerability or resiliency traits that may develop in response to early attachment and parenting experiences and predispose or protect individuals when faced with precipitating interpersonal difficulties throughout their lifetime. Two potential mediating factors were examined in the same study (Self-criticism and Dependency; Falgares et al., 2017) and two independent studies both examined self-control (Heydari et al., 2015; Valikhani et al., 2018).

Intrapersonal predisposing factors. Four studies examined predisposing factors that were intrapersonal in nature; i.e. existing within the person or their mind (Falgares et al., 2017; Heydari et al., 2015; S. Kidd & G. Shahar, 2008; Langhinrichsen-Rohling et al., 2017).

Self-Control. Two studies undertaken in Iran examined self-control within the context of attachment and suicide ideation. In a modest non-psychiatric sample of adults

undergoing chemotherapy, Valikhani et al. (2018) ran a hierarchical regression and applied Baron and Kenny (1986) criteria to investigate the mediating role of self-control on the relationship between attachment styles (secure, ambivalent, avoidant) and suicide ideation. They used an established, validated measure of self-control (Self-Control Scale; Tangney et al., 2004) that measures a person's ability to control their impulses, alter their emotions and thoughts, and to interrupt undesired behavioural tendencies and refrain from acting on them. Only ambivalent (anxious) attachment was found to contribute unique variance in suicidal ideation ($\beta = .39$, $p = .004$); and self-control fully mediated this relationship as the direct effect was no longer significant once self-control was included ($Z = 1.85$, $p = 0.63$). However, due to the small sample size the study may have been underpowered to detect any relationship between avoidant attachment and suicidal ideation. Furthermore, the study was limited by its measure of suicidal ideation which comprised of two bespoke items summed to confirm the existence and intensity of ideation.

Heydari et al. (2015) evaluated the mediating role of self-control in a much larger sample of University students ($n = 336$). Like Valikhani et al. (2018), they conceptualised individuals low in self-control to be impulsive and impatient, but administered a less established measure of self-control their research group had used in previous research. Anomie, the perceived breakdown of social bonds between an individual and their community, was also included in their hypothesised model and will be discussed in more detail later in the paper. Using Structural Equation Modelling (SEM) and bootstrapping methods, the authors found Mother and peer attachment were related to suicidal ideation directly, and indirectly via self-control and anomie (BC CI = $-.14$, $p < .001$). Furthermore, self-control was found to have the largest total effect on suicidality ($-.45$), as well as having a significant indirect effect on suicidality via anomie. The larger sample size is a

methodological strength of this study as it allowed for more robust statistical analysis; however, their choice of less established self-report measures may have limited the validity of their findings.

Maladaptive schemas. In another large sample of college students ($n=766$), Langhinrichsen-Rohling et al. (2017) used bootstrapped mediational analysis to assess the role of maladaptive self-schemas in the relationship between parental attachment, assessed using the IPPA (Armsden & Greenberg, 1987), and recent suicide ideation. Five cognitive self-schemas thought to be most relevant in the attachment-suicide relationship were assessed using Young's Schema Questionnaire (Young, 1998); abandonment, defectiveness, self-sacrifice, emotional deprivation and unrelenting standards. A significant indirect effect was demonstrated [BCa 95% CI = -.0162, -.011], supporting the predicted hypothesis that the direct negative relationship between secure parental attachment and suicidal ideation ($\beta = -.15$, $p < .05$) is driven by maladaptive self-schemas. However, although the authors referenced the specific schemas when reporting the results of preliminary correlational analyses, the mediation analysis only referred to a general variable of 'maladaptive schemas'. There was no clarification to whether the mediating variable represented a total combined score of the five schemas, or only those found to be significantly correlated with the independent and dependent variables (abandonment, defectiveness and emotional deprivation). Furthermore, as recognised by the authors, relations between some variables were statistically significant but relatively small. Given the large sample size, these effect sizes may not translate into clinically meaningful relationships.

Self-criticism. In a cross-sectional study of Italian high-school students, Falgares et al. (2017) examined whether the personality trait of self-criticism mediated the relationship between two-dimensions of attachment insecurity and suicide risk. Individuals

high in self-criticism tend to experience feelings of guilt and self-blame during instances of perceived failure (S.J. Blatt & Bless, 1996). As indicated by significant indirect effects for both bootstrapped mediation models, this intrapersonal vulnerability was found to mediate the relationship between attachment anxiety and lifetime suicidality [BCa 95% CI = .06, .25] and attachment avoidance and suicidality [BCa 95% CI = .04, .23]. Although this study has methodological strengths including its well-powered statistical analysis, the measure of attachment was adapted for use in an Italian sample and only demonstrated Cronbach alpha coefficients between .62 - .76. Furthermore, the use of a student sample limits the generalisability of the findings to more diverse populations and the ability to make clinical inferences.

Self-esteem. Finally, in a cross-sectional study of homeless youth, S. Kidd and G. Shahar (2008) examined various risk and resiliency factors in relation to suicidal ideation. Suicidal ideation was associated with fearful ($r = .23$, $P < 0.01$), preoccupied ($r = .16$, $p < .05$) and secure attachment ($r = -.15$, $p < .05$), and self-esteem was a significant resiliency factor associated with suicidal ideation ($B = -.21$, $p < .001$). However, no significant interactions were found between self-esteem and any of the attachment scales, indicating that self-esteem did not moderate the effect of attachment insecurity on suicidal ideation. However, as this study did not examine the mediational role of self-esteem in the relationship, this cannot be ruled out. Furthermore, due the nature of the population and the number of variables investigated, the study relied upon brief (albeit validated) measures of attachment, suicidal ideation and self-esteem that may have not sufficiently captured the complexity of these psychosocial constructs.

Interpersonal predisposing factors. Three studies examined predisposing factors considered to be more interpersonal in nature; i.e. relating to relationships or communications between people (Falgares et al., 2017; Levi-Belz et al., 2013; Stepp et al.,

2008). These factors did not reflect acute interpersonal experiences that could be considered precipitating factors, but rather vulnerability traits that predispose individuals to difficulties in interpersonal interactions and relationships.

Dependency. This personality trait was also studied by Falgares et al. (2017) in their cross-sectional study of Italian high-school students. Individuals high on dependency tend to be pre-occupied with issues of closeness and interpersonal connectedness, and subsequently are especially sensitive to separation and loss (S.J. Blatt & Bless, 1996). Using SEM and bootstrapped mediational analyses, their results indicated that high attachment anxiety was associated with greater dependency ($\beta = 0.39, p < 0.001$), which in turn was associated with lower suicidality ($\beta = -0.14, p < 0.05$). The indirect effect of attachment anxiety on suicidality via dependency was also significant [BCa 95% CI: $-0.11, -0.01$] confirming a negative effect where lower levels of dependency mediated the relationship between high anxious attachment and greater suicide risk. Although low dependency was also found to relate to attachment avoidance ($\beta = -0.17, p < 0.01$), the indirect effect of attachment avoidance on suicidal behaviour via dependency was not significant (BCa 95% CI: $-0.01, 0.03$). Therefore, these results indicate that highly dependent individuals seem to be at less risk for suicide.

Self-disclosure. Levi-Belz et al. (2013) sampled a group of patients who were admitted to hospital following a suicide attempt, and examined the role of self-disclosure in the relationship between attachment and suicide lethality. Self-disclosure refers to the extent by which individuals let themselves be known to others, and was measured using the Jourard Self-Disclosure Questionnaire (Jourard, 1971) where participant rated how much they shared important areas of their lives with others, including attitudes, interests, study and work, personality, finance and the body. Using path analysis, high avoidant attachment was found to contribute indirectly to suicide attempt lethality through low self-

disclosure. Self-disclosure was not found to mediate the relationship between anxious attachment and medical lethality. This study used sophisticated statistical analysis to explore the relationships between attachment, interpersonal variables and suicide attempt lethality, and like most studies in the current review it did not provide a power calculation to confirm it was statistically powered to detect effects. However, this is more problematic for the current study due to the moderate sample size ($n=102$), and the fact only 35 patients were allocated to the medically-serious suicide attempt group.

Interpersonal problems. In an adult sample of psychiatric patients, Stepp et al. (2008) used logistic regression to predict suicide-related group membership based on dimensions of avoidant and anxious attachment, and interpersonal difficulties. ‘Interpersonal Difficulties’ as measured using the Inventory of Interpersonal Problems (IIP; Horowitz et al., 1988), encompassed five sub-scales of different problems; interpersonal sensitivity, interpersonal ambivalence, aggressive, need for social approval and lack of sociability. Stepp et al. (2008) was the only study that did not measure attachment security using a self-report questionnaire, but rather employed a consensus rating process based on participants’ responses during three two-hour interviews. Participants’ interview responses were also used to categorise them into one of four groups based on their history of self-injurious behaviour; none, self-harm only (SH), suicide attempts only (SA) or a combination of self-harm and suicide attempt history (SH+SA). For anxious attachment, a significant indirect effect through interpersonal sensitivity was found when comparing SH+SA versus none ($z = 2.05$, 42.6% mediated), through interpersonal aggression for the contrasts of SH+SA versus none ($z = -2.29$, 35.8% mediated), and through lack of sociability for the contrast between SA versus none ($z = 2.04$, 14.4% mediated). For avoidant attachment, there was only one significant indirect effect of avoidant attachment style through interpersonal sensitivity for the contrasts of

SH+SA versus none ($z = -1.99$, 34.94% mediated). Overall, their findings indicated a role for different interpersonal difficulties in the relationship between attachment insecurity and suicide-related behaviours.

Summary of research examining predisposing factors. Collectively, there is preliminary evidence that various psychological vulnerabilities associated with insecure attachment predispose individuals to suicide-related outcomes. This includes maladaptive self-schemas which develop from internal structuring of early experiences, intrapersonal traits of low self-control and high self-criticism and more interpersonal traits of low dependency, self-disclosure and a variety of interpersonal difficulties. The moderating role of self-esteem was not evidenced; however, future investigations could examine a mediator role within a larger clinical population. There was also considerable heterogeneity pertaining to the choice of suicide-related outcome measures, the theoretical conceptualisation of attachment and the population under investigating; which made between-study comparisons challenging. Furthermore, all studies employed cross-sectional designs and therefore can only be exploratory in nature as causality cannot be inferred.

Precipitating factors. Three studies examined more acute, interpersonal difficulties that could precipitate the onset of an attachment crisis.

Loneliness. In their study of attachment and medical lethality of suicide attempters, Levi-Belz et al. (2013) administered the UCLA loneliness scale (ULS; Russell et al., 1980) to measure subjective feelings of loneliness and social isolation. Although feelings of loneliness can persist over time, the scale captures more acute feelings of social isolation (e.g. ‘I have nobody to talk to’, ‘I feel left out’) rather than an underlying vulnerability trait. Results of their path analysis found self-reported loneliness to mediate the effect of both avoidant and anxious attachment on medical lethality of suicide

attempts. This supported their main hypothesis that anxiously-attached individuals reporting increased levels of loneliness would be at risk for engaging in more lethal suicide attempts, however unexpectedly higher standardised estimates were found for the avoidance path.

Thwarted belonging and perceived burdensomeness. The only study that exclusively sampled adolescent participants (Venta et al., 2014) examined the role of two states defined in the Interpersonal Theory of Suicide (Joiner, 2005); perceived burdensomeness and thwarted belonging. These were assessed using the Interpersonal Needs Questionnaire (INQ; Van Orden et al., 2008) which asks participants to respond based on how they have been feeling recently and captures subjective feelings of being a burden to others and not belonging in their social world. Results of their bootstrapped mediation analyses found an indirect effect for thwarted belonging in the relationship between maternal attachment security and suicidal ideation [BCa 95% CI = -0.248, -.042]. However, they did not examine the role of perceived burdensomeness in this relationship due to an insignificant relationship with attachment security in the preliminary analyses ($r = -.246$, $p = .079$). However, less than half ($n=52$) of participants completed questions about perceived burdensomeness and therefore low statistical power could explain null findings. Furthermore, they assessed for the presence of suicidal ideation using one item from a measure of depression (BDI-II; Beck et al., 1996), which may not provide sufficient variation in levels of suicidal thoughts.

Anomie. In their study of Iranian University students, Heydari et al. (2015) also investigated the role of feelings of anomie in the relationship between parent and peer attachment and suicidal ideation. The term was first introduced by Durkheim (1951) in his study of suicide and refers to a condition of instability, that can occur within societies or individuals, where social cohesion and bonds break down. Along with self-control

(discussed previously), feelings of anomie were found to be a significant mediator in the relationships between mother and peer attachment, and suicidal ideation. Additionally, an indirect relationship between self-control and suicidality was found via anomie [(BC = -.26, ER = .078, $p < .001$], indicating that feelings of social incohesion bridges the gap between a trait vulnerability (self-control) and suicidal thoughts.

Social adjustment. In a large sample of patients with major depression, Lizardi et al. (2011) investigated the relative associations of attachment style and social adjustment with lifetime attempt history, and whether there were any significant interactions that would indicate a moderation effect. Social adjustment over the past fortnight was assessed across six major behavioural and emotional domains, however only poor work adjustment ($t = 2.571$, $p = .011$) and anxious attachment ($t = 2.361$, $p = .019$) differentiated attempters and non-attempters. Logistic regression analyses found work adjustment to exhibit a statistically significant relationship to suicide attempt status ($OR = 1.25$, $p = .03$), and there was no significant interaction between anxious attachment and work adjustment ($p = .081$). As this study only included participants with major depression, its findings cannot be generalised to other psychiatric conditions or non-clinical samples. Furthermore, the dichotomous nature of classifying participants as attempters or non-attempters based on their lifetime history does not account for variation in the frequency or recency of attempts. Assessing current adjustment in relation to current suicidality may have yielded different results.

Summary of research examining precipitating factors. Only four studies examined acute, precipitating factors that could influence the relationship between the distal risk factor of attachment insecurity and current suicide-related thoughts and behaviours. The three state variables found to bridge this gap (feelings of loneliness, anomie and thwarted belongingness) were all internal experiences associated with social

isolation and relationship breakdowns. Furthermore, these were measured in relation to recent suicidal ideation or attempt behaviour, rather than a retrospective measure that may result in recall bias (Lizardi et al., 2011).

Crisis Factors. Three studies examined feelings or states that often occur shortly before or alongside suicidal thoughts and behaviours (Cohen et al., 2017; Li et al., 2017; Strang & Orlofsky, 1990).

Suicide crisis syndrome. Cohen et al. (2017) investigated the mediating role of a ‘suicide crisis syndrome’ (SCS); a hyper-aroused negative affect state driven by feelings of entrapment, with panic-like symptoms, hopelessness, ruminative flooding. The defining features of the SCS was measured using the Suicide Triggers Scale (STS-3; Yaseen et al., 2014) a self-report questionnaire developed to assess the hypothesised SCS, in a cross-sectional study of psychiatric inpatients. Using a series of linear regression analyses, the SCS was found to be a partial mediator of the relationship between fearful attachment and lifetime suicidal phenomena ($z = 3.22, p = .001$). This relationship was found to be bi-directional, indicating that in addition to fearful attachment predisposing individuals to experience the SCS, experiencing panic-like, acute affect states may reinforce fearful attachment. However, the STS-3 is made up of five subscales that capture different components of the SCS. The use of a composite score rather than examining the potential mediating role of the different components limits the conclusions that can be drawn from this study.

Entrapment. Conversely, Li et al. (2017) only administered the entrapment subscale of a revised version of the suicide trigger scale – the Suicide Crisis Inventory (SCI; Galynker et al., 2017). In one of two longitudinal studies, Li et al. (2017) assessed adult attachment styles (fearful, dismissing, preoccupied and secure) in patients within 72 hours of being admitted to an inpatient psychiatric unit for suicide risk, followed by

measures of entrapment at discharge and suicide attempts over a 1-2-month follow-up period. Only fearful attachment was significantly associated with suicide attempts (actual, aborted or interrupted) during the follow up period. In the mediational model, the indirect effect of fearful attachment on suicide attempts via entrapment was significant after controlling for lifetime suicide attempts at baseline [BCa 95% CI = .012, .388]. Follow-up data was only obtained for 85 participants, 42.5% of the initial sample size, and only eleven of those participants reported suicidal behaviour at follow-up. This limits the power of the study to detect significant effects for other insecure attachment styles and increases the risk of attrition bias.

Hopelessness and helplessness. The oldest study in review, Strang and Orlofsky (1990) examined three factors thought to be involved in suicidal ideation: an absence/disruption of interpersonal attachments, a conviction of personal helplessness and a sense of hopelessness about the future. Participants were compared based on their severity of suicide ideation (non-ideators, low ideators or moderate-high ideators). Security of interpersonal attachment measured using the IPPA (Armsden & Greenberg, 1987) was found to differentiate among the three groups, with the most extensive differentiation on the attachment to parent subscales ($F_{(2, 188)} = 19.34, p < .01$). Moderate-high ideators also expressed more hopelessness concerning the future and the helplessness view that events are controlled by external forces. Results of the multivariate analyses found these factors exerted their influence on suicidal ideation in an additive manner, as neither a 3-way interaction term or any 2-way interaction terms contributed significantly to the differentiation of groups beyond that provided by attachment and hopelessness entered as main effects. However, the three factors were moderately inter-correlated which would have reduced the likelihood of obtaining any significant interaction effects.

Summary of research examining crisis factors. Two studies provided tentative evidence that acute distressing feelings of entrapment, hopelessness and panic-like dissociation, which may be experienced shortly before or alongside suicidal thoughts and behaviours, partially account for the association between attachment insecurity and suicidality. This mediational effect was only observed for fearful attachment, indicating that being high in this style of attachment may predispose individuals to risk above and beyond other attachment styles and dimensions via feelings of acute crisis. Hopelessness and helplessness were not found to moderate the impact of attachment on suicidal ideation (Strang & Orlofsky, 1990), but were associated with suicidal ideation. This suggests that attitudes of hopelessness and helplessness may exert an effect independent of attachment, or mediate this relationship like feelings of entrapment.

Psychopathology. Three studies examined whether the presence of a mental health condition, or associated symptomology, mediated the relationship between attachment and suicide-related outcomes (Gormley & McNiel, 2010; Grunebaum et al., 2010; Rodgers et al., 2011).

Depression. The link between depression and suicide has been well established in high-income countries (World Health Organisation, 2018), therefore it is unsurprising that all three studies examined whether the presence of depressive affect or a depressive disorder explains the relationship between attachment insecurity and suicidality. Gormley and McNiel (2010) analysed cross-sectional data collected from patients on an acute, psychiatric inpatient unit over an 8-month period. Their aim was to investigate whether depressive symptoms mediated any relationships between attachment insecurity and a history of attempted suicide, which was established based on a single self-report item. Based on preliminary analyses, their mediational analyses only examined the relationship between anxious attachment and suicide attempt history, with depressive symptoms as a

mediator. The Sobel test statistic (1.97, $p = .047$, 95% CI = 0.022, 0.35) was found to be sufficiently large and significant, indicating that depressive symptoms partially mediated the relationship between attachment anxiety and suicide attempt history.

A similar model was examined by Grunebaum and Colleagues (2010), who performed a longitudinal analysis to test whether presence of a major depressive episode (MDE) mediated the relationship of attachment style to suicide attempt during follow-up. Here, the presence of a MDE was clinician-rated using the SCID-I (Spitzer, Williams, Gibbon, & First, 1990) during follow-up evaluations. Greater avoidant attachment was found to predict suicide attempt during the 1-year follow up period, independent of past attempt status, objective depressive severity, hopelessness, and reasons for living and social adjustment. Furthermore, MDE during follow-up conferred a 17-fold increase in risk of attempted suicide. However, mediation by MDE was not evidenced; the hazard ratio for attachment as a predictor of suicide ($z=3.82$, HR = 1.16, 95% CI = 1.07 to 1.25) was not appreciably smaller in the model adjusted for recurrent MDE ($z = 3.81$, HR = 1.13, 95% CI = 1.06 to 1.20). Interestingly, neither attachment factor predicted MDE status during the follow up period. These results indicate that avoidant attachment may represent an independent risk factor for future suicide attempts, but this relationship does not operate via a major depressive episode. However, when subjective depressive symptom severity was assessed using the BDI-II (Beck et al., 1996), the effect of avoidant attachment reduced to the trend level, indicating that participants' self-reported depressive symptoms may explain some of the effect of avoidant attachment on suicide attempts. However, this was not explored through formal mediation analysis. Whilst this study was judged to have less bias due to its prospective longitudinal design, the analysis was restricted to patients who provided follow-up data. Those participants available for contact after one-year may not be representative of the initial baseline sample, reducing the

generalisability of the findings. Furthermore, it is not reported whether any of the participants who could not be contacted at follow-up were lost due to completed suicide.

“Defensive” psychopathology. Rodgers et al. (2011) tested a model of suicidal ideation among adolescents and young adult students. They hypothesised that the effect of parental attachment on suicidal ideation would be mediated by both depression and ‘defensive’ psychopathology; a latent group of defensive symptoms comprising of substance use, borderline personality disorder features and dissociative experiences. As females reported higher levels of suicidal ideation, borderline traits and depression than their male counterparts, and males reported higher levels of substance abuse; the model was tested separately for each gender. Whilst the model was a better fit for the data from females, in both genders all proposed indirect paths were significant indicating a fully mediated relationship between parental attachment and suicidal ideation, via depression and defensive psychopathological symptoms. For males, a direct relationship was also found between self-reported depression and suicidal ideation. Due to the large sample ($n=615$) structural equating modelling was appropriate, however the findings are limited to students who are typically well-educated and of a higher socioeconomic status. This population is not representative of the wider population who experience difficulties with low mood and borderline traits and substance misuse, and therefore cannot be generalised beyond the current sample.

Summary of research examining psychopathological variables. These studies provide some initial evidence that self-reported symptoms of mental distress may mediate the relationship between attachment insecurity and suicidal ideation (Rodgers et al., 2011) or suicide attempts (Gormley & McNiel, 2010). However, when the presence of a psychiatric illness was objectively evaluated using a standardised diagnostic instrument, there was no evidence for a mediation effect. Although clinician-ratings of an MDE was

associated with greater suicide risk of future suicide attempts (Grunebaum et al., 2010), in the relationship between attachment and suicide a persons' perception of their own distress appears to have more explanatory power than an objective diagnosis.

Discussion

The objective of this review was to highlight psychological processes that have been implicated in the relationship between attachment and suicide ideation and behaviour. As this is an emergent field of literature, the secondary aim was to highlight areas of methodological weakness that could be remedied in future research.

Psychological mechanisms in the attachment/suicide relationship

Arguably the clearest finding from the systematic review was the heterogeneous nature of research published in this area. Studies differed in their theoretical approach to assessing attachment, choice of outcome measure, sample population, statistical analyses and the additional psychological factors under investigation. This meant a meta-analysis was inappropriate. However, the Adams (1994) model provided a useful framework for bringing together this set of disparate studies into a coherent narrative. Key findings are discussed below in the context of the attachment-based model.

Mediating factors. Of the fifteen studies included in the present review, twelve explored mediating factors in the relationship between attachment and suicide-related outcomes. Most focused on psychological or personality traits that could increase or decrease an individual's susceptibility to future suicide-related behaviour (pre-disposing factors). A significant mediational role was evidenced for a range of predisposing factors including intrapersonal qualities such as high self-criticism, low self-control and maladaptive self-schemas, and more interpersonal difficulties such as limited self-disclosure, interpersonal sensitivity and aggression and lack of sociability.

An interesting finding was the negative mediational effect of dependency in relationship between anxious attachment and lifetime suicidality (Falgares et al., 2017). The characteristics of dependent individuals are conceptually similar to anxious attachment (Zuroff & Fitzpatrick, 1995), therefore it was unsurprisingly that high dependency and attachment anxiety were associated in Falgares and colleagues' (2017) study of Italian high school students. However, being highly dependent is typically regarded as a detrimental quality associated with depression (Sidney J Blatt & Zuroff, 1992), yet here it was found to be a protective factor against suicidal behaviours. Dependent individuals may be more likely to draw on social resources when experiencing interpersonal difficulties, and therefore less likely to resort to suicidal thinking and behaviours. Or, as suggested by Falgares et al. (2017), dependency may be an important defensive mechanism for anxiously-attached individuals as it guarantees other people's availability and validation in times of need. Furthermore, dependency is associated with love for romantic partners and fear of losing this relationship (Zuroff & Fitzpatrick, 1995). Suicide would be the ultimate method of cutting emotional ties, therefore it seems logical that dependent individuals would want to avoid death and resort to other methods to communicate distress and seek emotional support. Going forward, research needs to confirm whether this finding generalises to the wider population or clinical participants, and whether this effect would be replicated in Northern European or North American sample.

Self-control was the only psychological variable to be examined across multiple studies (Heydari et al., 2015; Valikhani et al., 2018). Individuals high in self-control are thought to be more patient and less impulsive, and therefore less prone to self-destructive desires (Cheung & Cheung, 2008). When attachment was measured on three dimensions in cancer patients, self-control was only found to mediate the relationship between

anxious-attachment and suicidal ideation. This suggests having an anxious-attachment style may increase the likelihood of being low in self-control, which in turn predisposes individuals to consider suicide when undergoing significant life stress (i.e. cancer treatment; Valikhani et al., 2018). Heydari et al. (2015) examined trait levels of self-control in combination with feelings of anomie, making it the only study to demonstrate how vulnerability traits and acute factors may interact to produce subsequent suicidal ideation. In addition to both variables mediating the relationship between attachment and suicidal thinking, two other mediational models were found to be significant; (1) maternal attachment indirectly related to anomie via self-control, and (2) self-control had a significant indirect effect on suicidal thinking via feelings of anomie. This implies a developmental pathway where poor maternal attachment fosters traits of low self-control, which makes individuals more vulnerable to suicidal ideation when unmasked by feelings of anomie (a state characterised by a lack of social cohesion and broken bonds) later in life. This provides initial evidence that suicide-related outcomes are the consequence of a diathesis-stress effect, and more research should endeavour to examine the role of multiple, interacting mechanisms.

Only a few studies examined current experiences that could be categorised as precipitating factors; attachment patterns were found to contribute indirectly to suicide-related via loneliness, the perception of not belonging, and individual feelings of anomie (Heydari et al., 2015; Levi-Belz et al., 2013; Venta et al., 2014). These are not external factors such as adverse life events or daily hassles, but reflect more transient internal experiences that could interact with trait vulnerabilities to trigger an attachment crisis. Loneliness was examined in relation to the medical lethality of suicide attempts, rather than the presence or absence of suicide-related behaviour. A mediational effect was more pronounced in avoidant attachment, indicating that though avoidant individuals may fear

intimacy due to their distrust of others, the ensuing feelings of loneliness may propel them to engage in more lethal behaviour. Alternatively, less pronounced loneliness may protect individuals with an insecure attachment against carrying out lethal actions. This is consistent with Adams (1994) and other suicide theorists (Farberow & Shneidman, 1961; Williams, 1997) who have speculated that when the underlying motivation of suicide-related behaviour is communication, the behaviour will be less life-threatening. Whereas, when individuals are crippled by loneliness and social interaction is unattainable they may engage in more dangerous suicidal-behaviour with intention to end their life.

Two papers examined components of a ‘suicide crisis syndrome’; an acute state hypothesised to precede suicidal behaviour that incorporates feelings of entrapment, panic-dissociation, ruminative flooding, emotional pain and fear of dying (Galynker et al., 2017). Whereas Cohen et al. (2017) examined the overall state as a mediating factor, Li et al. (2017) focused on the entrapment subscale in their longitudinal analysis. Both studies found significant effects, and it would be informative to explore whether other subcomponents of this acute state demonstrate a similar mediational role. Entrapment, the felt need to escape from a situation perceived as unbearable and inescapable, is a key psychological element in several models of suicidal ideation and behaviour (O’Connor, 2011; Williams, 2001). In the Integrated Motivational-Model of Suicidal behaviour, entrapment determines suicidal intent when suicidal behaviour becomes the only solution to life circumstances, such as chronic or acute stress (O’Connor, 2011). Similarly, the two studies that measured entrapment in the current review conceptualised entrapment as part of an acute state close in proximity to the suicide-related behaviour. Therefore, drawing on Adams (1994) model, entrapment would either characterise or closely precede an attachment crisis that motivates individuals to use suicide-related behaviours. This finding was only demonstrated for fearful attachment which is characterised by a negative view of

both the self and others (Bartholomew & Horowitz, 1991). Perhaps those individuals who are unable to draw on their own personal resources, or support from others, may feel more trapped when they experience acute stress, and therefore become more likely to engage in suicidal behaviour.

A final consideration is mental illness and whether there is a role for psychiatric concepts in psychological models. Only self-reported symptoms of psychopathology were found to mediate the relationship between attachment and suicide-related outcomes, indicating that subjective experience is more explanatory than objective psychiatric diagnoses. However, it is important to consider what is being assessed when researchers measure symptoms of psychiatric conditions such as depression. The Beck Depression Inventory (Beck et al., 1988) was used in two studies, which examines recent emotions such as sadness and guilt, beliefs about being a failure and self-critical thoughts, physical and cognitive change, and a loss of motivation and interest life. This multi-faceted measure captures a broad range of psychological processes and experiences making it unclear which components drive the relationship between attachment and suicide. Adams (1994) suggested that the coexistence of a major mental disorder could be a general moderating factor which interferes with judgement, impulse control and social relationships. Yet, what is being measured by instruments such as the BDI feels more akin to the acute attachment crisis, or even tapping into more trait vulnerabilities such as sense of self-worth and self-criticism. Going forward, research that aims to clarify the role of psychological processes in diathesis-stress models of suicide needs to focus on more specific constructs rather than broad psychiatric labels. Particularly as prior research has demonstrated that in order to be effective psychological interventions (e.g. CBT) need to focus on suicidal behavioural, not depression, to be effective (Tarrier, Taylor, & Gooding, 2008).

Moderating factors. Only three studies explored moderation effects, and none found evidence of an interaction between attachment styles and their choice of psychological mechanism on suicidal ideation or attempt history. Adams (1994, p. 290) does propose a role for moderating variables in his model, termed ‘contributing factors’, which are thought to act in a more general way to ‘*augment, facilitate or suppress the expression*’ of predisposing or precipitating factors. Examples of contributing factors were social factors (i.e. living in an area of social deprivation) or co-existing substance abuse or mental disorders. However, the moderating variables explored in the current review are more akin to vulnerability factors caused by insecure attachment (low self-esteem), precipitating factors that could trigger an attachment crisis (social adjustment), or reactions to threatened loss (hopelessness, helplessness) that would characterise an attachment crisis and precede suicidal behaviour. Therefore, the absence of significant moderation effects is consistent with Adams’ (1994) model, and different results may have been found if these variables had been explored as mediating variables.

Critical Appraisal of the Literature

Design and sample generalisability. Several limitations and areas for bias were revealed by the quality assessment process. Despite using a tool that was designed to assess observational research, only half of the evaluated studies met at least 50% of the quality criteria, with the highest score being 64% (Li et al., 2017). This was mostly attributable to the prominence of cross-sectional designs; only two studies assessed attachment style at a time point prior to the suicide-related outcome variable, and neither population was free from suicide at the baseline assessment. Thus, causality and direction of effects between target variables cannot be inferred from most findings, which is a major limitation of research aiming to examine pathways between early vulnerability factors and later suicide-related behaviour. However, small-scale, less rigorous designs are common in

exploratory research to test initial hypotheses. Now that important groundwork has been laid, alternative designs can be employed to verify temporal and causal relationships.

Similarly, a third of studies relied on data from student samples to examine their hypotheses. This is also common within exploratory research to enable recruitment of large samples so more sophisticated statistical analyses can be performed. However, it is difficult to generalise these findings to the wider population as students tend to be more homogeneous in regards to age, ethnicity, education-attainment and socioeconomic status. Furthermore, it is debatable how comparable student samples are to smaller, clinical populations where individuals are more likely to have experienced social deprivation and childhood adversity.

Likewise, twelve studies were conducted in North America or Western Europe, limiting the generalisability of conclusions to other countries and cultures. The three studies that sampled participants from middle-eastern countries found evidence for mediational effects similar to research conducted in Western populations; however, they explored different psychological mechanisms which may be more relevant to their culture. Both studies conducted in Iran examined the mediating role of self-control (Heydari et al., 2015; Valikhani et al., 2018). Being low in self-control was considered problematic as it increases the likelihood for impulsivity, selfishness and disobedience (Heydari et al., 2015). It is conceivable this would be viewed pejoratively in a collectivist culture that values the needs of the community over individual impulses, but it may not have the same mediational role in western societies.

Measurement issues. Self-report measures were used predominantly to measure attachment style, suicide-related outcomes and psychological variables. These are often subject to retrospective bias and can lead to participants reporting socially desirable outcomes. Furthermore, they cannot detect when defences distort responses, or phenomena

that needs to be activated (such as attachment) in order to be manifested (Ravitz et al., 2010). Within the attachment field, self-report measures are often used over the gold standard Adult Attachment Interview (AAI; George, Kaplan, & Main, 1996) because they are more feasible to administer in clinical settings. This was observed in the current review; only one study utilised an alternative method to self-report that relied on clinician ratings of semi-structured interviews (Stepp et al., 2008). However, there is an argument that dimensional self-report instruments may have greater utility in research because they can detect more subtle variations in attachment compared to restrictive categorical measures (Ravitz et al., 2010).

Despite the breadth of different instruments used to measure attachment, no study explicitly measured disorganised attachment. This is a common oversight within the attachment literature as easy-to-administer self-report measures tend to capture orthogonal dimensions of insecure, yet organised attachment (Paetzold, Rholes, & Kohn, 2015). Rather than an organised approach, individuals classified as unresolved or disorganised use competing strategies of approach and avoidance when trying to manage and resolve threat. This confusing method is thought to impact on daily functioning and increase vulnerability for various types of psychopathology later in life (Bakermans-Kranenburg & van IJzendoorn, 2009; Cassidy & Mohr, 2001). Research that has measured disorganised attachment in relation to suicide using the AAI found 'unresolved-disorganised' to be a predominant attachment style among participants with a history of suicide ideation (Riggs & Jacobvitz, 2002) and attempts (Adams et al., 1996). Furthermore, both studies found a greater rate of attachment-related trauma (e.g. childhood abuse) in suicidal participants, demonstrating the close relationships between early trauma, disorganised attachment and later suicide-related behaviour.

Three studies in the current review adopted Bartholomew and Horowitz (1991) categorical model which includes fearful attachment; a style sometimes equated with disorganised attachment because it reflects a mixed attachment strategy that includes both anxiety and avoidance dimensions (Bartholomew & Horowitz, 1991; Mikulincer & Shaver, 2007). All three found only fearful attachment to relate to suicide-related outcomes; indicating that these individuals are at greater risk than preoccupied or dismissing individuals who rely on one coherent attachment strategy. However, other researchers have argued that disorganised attachment is a distinct theoretical construction that cannot be viewed as a combination of organised strategies (Paetzold et al., 2015). Therefore, by not capturing disorganised attachment the current research may have overlooked a key pattern of attachment that predisposes individuals to greater risk.

Adams' (1994) model emphasised the role of adverse parenting as a precursor for secure or insecure attachment, which has been evidenced in research showing indirect relationships between negative early experiences (childhood maltreat, adverse parenting styles) and suicide-related thoughts and behaviour via insecure attachment (Nunes, 2017; Restrepo, 2016; Twomey, 2000). However, only two studies in the current review also administered measures of early adversity (Cohen et al., 2017; S. Kidd & G. Shahar, 2008), and neither were assessed in relation to attachment but viewed as separate independent variables. Therefore, more large-scale research is required to evidence the longitudinal developmental pathways outlined by Adams.

It is also important to emphasise that none of the studies included in the current review examined completed suicide; '*a self-inflicted death with evidence (either explicit or implicit) of intent to die*' (Silverman et al., 2007, p. 273). Instead, a range of suicide-related thoughts and behaviours were investigated including ideations, communications and attempts. Efforts were made to exclude studies that explicitly investigated self-

injurious thoughts or behaviour with no suicidal intent; however, few studies in the review explicitly measured intent. More commonly, authors inferred intent from participants' self-report that their thoughts or behaviours were suicidal in nature. Nonetheless, it should be held in mind that the current findings cannot be generalised to death from suicide which, albeit related, may be phenomenologically distinct from non-fatal suicide-related thoughts and behaviour.

Analytic strategies. An important limitation not highlighted by the quality assessment tool was the choice of statistical analysis. All but one study was published in the past decade, indicating that this was a contemporary collection of research studies. Yet, out of the twelve studies that tested mediation, five relied on outdated linear regression analyses as popularised by Baron and Kenny (1986). This approach is no longer recommended by statisticians who argue that mediation manifests itself empirically in the form of an indirect effect of independent variables on dependent outcomes (Hayes & Rockwood, 2017). Bootstrapping techniques are widely regarded as a method to allow inference about indirect effects (Preacher & Hayes 2004), and can be easily employed using macros written for SPSS, and SEM programs such as Mplus and AMOS. Also, contemporary thinking argues that individual paths between variables do not need to demonstrate significance for a mediational effect to be plausible (Hayes & Rockwood, 2017). Therefore, studies which chose to omit mediation analyses due to the absence of significant effects between certain variables may have missed the opportunity to detect existing mediational effects.

Strengths and Limitations of the Review

The current review has several strengths. Foremost, this is the first systematic review to focus on psychosocial variables that mediate or moderate the relationship between attachment styles and suicide-related outcomes. By integrating empirical findings

with an under-researched model of suicide, the current review makes a valuable theoretical contribution to the research field and has highlighted potential areas for future research. Second, the search strategy was informed by the PRISMA statement (Moher, Liberati, Tetzlaff, Altman, & Group, 2009) and included a comprehensive list of search terms tailored to each electronic database. This thorough and systematic approach reduces the possibility that key papers were overlooked and enables replication in the future as more research is published. Finally, reliability checks were carried out at the screening stage to ensure relevant papers were not being excluded, and when it was unclear if a full text met the criteria this was discussed amongst a four-person research team. This process revealed that the lead researcher was being overly inclusive, further reducing the possibility that important papers were missed. Therefore, this review used robust methodological procedures to ensure sufficient rigor and makes an important contribution to the research area.

However, the findings of the review must also be considered in the context of several methodological limitations. First, no age restrictions were imposed when searching the literature due to limited number of published studies in this area. Therefore, although the final set of studies mainly examined adult participants, a small number recruited adolescents or a combination of adolescents and young adults. Furthermore, due to the limited number of adolescent-only papers these developmental groups could not be examined separately. This increased the diversity of an already heterogeneous review, introduced potential developmental differences and a greater variety of attachment measures. However, three studies that examined adult participants (18 years+) measured parental attachment, therefore the inclusion of parental and romantic attachment measures would have remained if the review was restricted to adult populations.

Language restrictions applied at the screening stage may have excluded relevant studies from other languages and cultures and explain the bias towards research carried out in western societies. Likewise, restricting inclusion to peer-reviewed journal articles may have increased the quality of the evaluated research, but risks excluding relevant findings and increases publication bias. Only one study that examined mediation effects reported insignificant findings (Grunebaum et al., 2010), indicating that research with negative findings may have gone unpublished.

Self-harm refers to all intentional self-injury or self-poisoning, irrespective of motive or intent (Kapur, Cooper, O'Connor & Hawton, 2013). However, in line with Adam's (1996) model and to reduce further heterogeneity, the current review only included empirical research that measured suicidal thoughts and behaviour. As the primary distinction between suicidal and non-suicidal self-injury (NSSI) is whether the individual involved intends to end their own life (Nock, 2010), this dichotomous separation is a contentious issue. Whilst some researchers maintain that suicidal behaviour and NSSI differ in important ways (e.g. Muehlenkamp & Gutierrez, 2004), others argue that suicidal intent is a dimensional phenomenon and the motivations that underlie self-harm are often multiple, changing and unclear (Andover, Morris, Wren & Bruzzese, 2012; Hawton, Saunders & O'Connor, 2013; Kapur et al., 2013). By excluding studies that explicitly focused on non-suicidal self-injury, the current review could be criticised for potentially overlooking relevant studies where intent to end life was not explicitly assessed or could not be inferred from the study report (e.g. Glazebrook, Townsend & Sayal., 2016). As such, the conclusions drawn cannot be generalised to self-injurious thoughts or behaviour where the motive to take one's own life may be unknown or unclear. Given that a history of self-harm is a strong predictor of completed suicide (Hawton, Zahl & Weatherall, 2003), and many studies do not explicitly measure suicidal

intent, future research would benefit from moving away from a dichotomised conceptualisation and instead recognise the utility of measuring self-harm more generally.

The quality assessment tool was selected based on being specifically designed to evaluate cohort and cross-sectional designs. It was hoped this would increase variation in quality scores compared to a more general tool that would favour intervention-based research. However, most studies still received a low score because they all employed similar designs with comparable limitations. An adapted tool tailored to assess relevant issues pertinent to the field, such as the use of well-regarded attachment measures or appropriate statistical analysis for mediation analysis, may have been more appropriate. Finally, inter-rater reliability checks were not carried out for the quality assessment processes. However, as the primary aim was to highlight key areas of bias in the literature rather than assign studies a rating or score, the absence of inter-rater checks was less problematic.

Research Implications

Several suggestions for future research have already been referenced including the need for prospective, longitudinal designs and the consideration of disorganised attachment in relation to attachment and suicide-related outcomes. The current evidence base is extremely heterogeneous; therefore, research efforts should aim to replicate findings in studies using consistent conceptualisations of attachment and suicide, and in samples that are more generalizable to the wider population. Also, most studies only measured one or two intervening variables when theoretical models posit an interaction between early predisposing factors, more current precipitating events and feelings of acute distress prior to suicide-related behaviour. Going forward, it would be informative if studies measured multiple psychological variables and explored different pathways using intensive statistical techniques such as Structured Equational Modelling (Ullman &

Bentler, 2003). This would aid further understanding of the key psychological difficulties that emerge from insecure attachment styles, and how these pathways lead to suicide-related behaviours.

Using Adam's (1994) model as a framework, there are many psychological constructs closely linked to attachment that have currently been overlooked. Aside from Langhinrichsen-Rohling et al. (2017) who examined maladaptive schemas, few studies examined deficits that are closely linked to attachment within the literature. For example, mentalization impairments (Fonagy & Luyten, 2009) and affect dysregulation (Mikulincer & Shaver, 2008) are commonly related to early attachment disruptions and Borderline Personality Disorder, which is characterised by high rates of suicidality. Further verifying states of acute distress that may characterise the attachment crisis period (e.g. high anxiety, destructive anger, extreme hopelessness, impulsivity, ego decompensation) will highlight clear risk factors for imminent suicide-related behaviour. There is also a dearth of research confirming external precipitating factors that may serve as more proximal triggers, such as negative life events, daily hassles and interpersonal conflict. Experience-sampling methods (Shiffman, Stone, & Hufford, 2008) would be beneficial here, as they could examine momentary changes in acute distress in response to external proximal factors such as negative life events, daily hassles and interpersonal conflict.

Clinical implications

Clinicians working with suicidal clients should consider the impact of early attachment experiences when carrying out assessment and formulation. However, they also need to recognise the complexity of this relationship, and that it is the interaction between multiple psychological mechanisms that lead to attachment crises and suicide-related behaviour. Furthermore, not all suicidal behaviour serves the same function and

this may be formulated in relation to a person's idiosyncratic attachment pattern and trait vulnerabilities.

Findings from the current review highlight several vulnerability traits that could be targeted with psychological interventions to reduce risk, such as maladaptive self-schemas, self-criticism, limited self-disclosure and interpersonal difficulties that impact the development of stable relationships. Aiming to reduce suicidal thoughts and behaviour without attending to underlying vulnerability traits and internal working models is unlikely to result in lasting and clinically meaningful change. It is also important that clinicians do not make assumptions, as evident by the finding that high dependency may be a protective factor for individuals with an anxious-attachment style. Given the findings highlighting the link between avoidant tendencies and factors such as loneliness and self-disclosure, social initiatives that reduce isolation and alienation may help to reduce lethal, self-injurious behaviours in vulnerable and hard-to-reach groups.

Conclusion

Overall, this is a promising area of exploratory research that has identified several psychological mechanisms that may influence the clear relationship between attachment difficulties and suicide-related behaviour. Preliminary evidence indicates a role for various psychological mediators that can broadly be categorised into underlying vulnerability / resiliency traits linked to early disruptions in attachment relationships, current experiences and acute states of mental distress. However, there is no evidence at present for more general contributing factors that may moderate these developmental pathways. However, due to the infancy of the research and the associated methodological limitations the findings can only be viewed as preliminary and more rigorous studies are required to verify their conclusions.

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Appendix A: Author Guidelines Clinical Psychology Review



CLINICAL PSYCHOLOGY REVIEW

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ISSN: 0272-7358

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Clinical Psychology Review publishes substantive reviews of topics germane to **clinical psychology**. Papers cover diverse issues including: psychopathology, psychotherapy, behavior therapy, cognition and cognitive therapies, behavioral medicine, community mental health, assessment, and child development. Papers should be cutting edge and advance the science and/or practice of clinical psychology.

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Bruce E. Wampold, University of Wisconsin at Madison, Madison, Wisconsin, USA
Carl F. Weems, Iowa State University, Ames, Iowa, USA
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Appendix B: Search Terms

Appendix B. Search Terms tailored to each electronic database

	Suicide		Attachment	
	<i>Keywords</i>	<i>MeSH / Subject Heading</i>	<i>Keywords</i>	<i>MeSH / Subject Heading</i>
EMBASE	suicid* OR parasuicid*	suicide/ OR suicide attempt/ OR suicidal ideation/ OR suicidal behaviour/	attach* OR bonding* OR child-parent-relat* OR mother-child-relat* OR object-relat* OR parent-child-relat*	emotional attachment/ OR object relation/ OR child parent relation/ OR mother child relation/
PubMed	suicid* OR parasuicid*	Suicide [Mesh] OR Suicidal Ideation [Mesh] OR Suicide, Attempted [Mesh]	attach* OR bonding* OR child-parent-relat* OR mother-child-relat* OR object-relat* OR parent-child-relat*	object attachment [MeSH Terms]
PsycINFO	suicid* OR parasuicid*	attempted suicide/ OR suicide prevention/ OR suicide/ OR suicidal ideation/	attach* OR bonding* OR child-parent-relat* OR mother-child-relat* OR object-relat* OR parent-child-relat*	attachment disorders/ OR attachment behavior/ OR attachment theory/ OR object relations/ OR separation anxiety/ OR separation anxiety disorder/ OR separation reactions/ OR mother child relations/ OR parent child relations/
Web of Science (includes MEDLINE)	(suicid*) OR (parasuicid*)	N/A	(attach*) OR (bonding) OR (child-parent-relat*) OR (mother-child-relat*) OR (object-relat*) OR (parent-child-relat*)	N/A

Appendix C: Quality Assessment Tool

Criteria	Yes	No	Other (CD, NR, NA)*
1. Was the research question or objective in this paper clearly stated?			
2. Was the study population clearly specified and defined?			
3. Was the participation rate of eligible persons at least 50%?			
4. Were all the subjects selected or recruited from the same or similar populations (including the same time period)? Were inclusion and exclusion criteria for being in the study prespecified and applied uniformly to all participants?			
5. Was a sample size justification, power description, or variance and effect estimates provided?			
6. For the analyses in this paper, were the exposure(s) of interest measured prior to the outcome(s) being measured?			
7. Was the timeframe sufficient so that one could reasonably expect to see an association between exposure and outcome if it existed?			
8. For exposures that can vary in amount or level, did the study examine different levels of the exposure as related to the outcome (e.g., categories of exposure, or exposure measured as continuous variable)?			
9. Were the exposure measures (independent variables) clearly defined, valid, reliable, and implemented consistently across all study participants?			
10. Was the exposure(s) assessed more than once over time?			
11. Were the outcome measures (dependent variables) clearly defined, valid, reliable, and implemented consistently across all study participants?			

Criteria	Yes	No	Other (CD, NR, NA)*
12. Were the outcome assessors blinded to the exposure status of participants?			
13. Was loss to follow-up after baseline 20% or less?			
14. Were key potential confounding variables measured and adjusted statistically for their impact on the relationship between exposure(s) and outcome(s)?			

*CD, cannot determine; NA, not applicable; NR, not reported

Guidance for Assessing the Quality of Observational Cohort and Cross-Sectional Studies

The guidance document below is organized by question number from the tool for quality assessment of observational cohort and cross-sectional studies.

Question 1. Research question

Did the authors describe their goal in conducting this research? Is it easy to understand what they were looking to find? This issue is important for any scientific paper of any type. Higher quality scientific research explicitly defines a research question.

Questions 2 and 3. Study population

Did the authors describe the group of people from which the study participants were selected or recruited, using demographics, location, and time period? If you were to conduct this study again, would you know who to recruit, from where, and from what time period? Is the cohort population free of the outcomes of interest at the time they were recruited?

An example would be men over 40 years old with type 2 diabetes who began seeking medical care at Phoenix Good Samaritan Hospital between January 1, 1990 and December 31, 1994. In this example, the population is clearly described as: (1) who (men over 40 years old with type 2 diabetes); (2) where (Phoenix Good Samaritan Hospital); and (3) when (between January 1, 1990 and December 31, 1994). Another example is women ages 34 to 59 years of age in 1980 who were in the nursing profession and had no known coronary disease, stroke, cancer, hypercholesterolemia, or diabetes, and were recruited from the 11 most populous States, with contact information obtained from State nursing boards.

In cohort studies, it is crucial that the population at baseline is free of the outcome of interest. For example, the nurses' population above would be an appropriate group in which to study incident coronary disease. This information is usually found either in descriptions of population recruitment, definitions of variables, or inclusion/exclusion criteria.

You may need to look at prior papers on methods in order to make the assessment for this question. Those papers are usually in the reference list.

If fewer than 50% of eligible persons participated in the study, then there is concern that the study population does not adequately represent the target population. This increases the risk of bias.

Question 4. Groups recruited from the same population and uniform eligibility criteria

Were the inclusion and exclusion criteria developed prior to recruitment or selection of the study population? Were the same underlying criteria used for all of the subjects involved? This issue is related to the description of the study population, above, and you may find the information for both of these questions in the same section of the paper.

Most cohort studies begin with the selection of the cohort; participants in this cohort are then measured or evaluated to determine their exposure status. However, some cohort studies may recruit or select exposed participants in a different time or place than unexposed participants, especially retrospective cohort studies—which is when data are obtained from the past (retrospectively), but the analysis examines exposures prior to outcomes. For example, one research question could be whether diabetic men with clinical depression are at higher risk for cardiovascular disease than those without clinical depression. So, diabetic men with depression might be selected from a mental health clinic, while diabetic men without depression might be selected from an internal medicine or endocrinology clinic. This study recruits groups from different clinic populations, so this example would get a "no."

However, the women nurses described in the question above were selected based on the same inclusion/exclusion criteria, so that example would get a "yes."

Question 5. Sample size justification

Did the authors present their reasons for selecting or recruiting the number of people included or analyzed? Do they note or discuss the statistical power of the study? This question is about whether or not the study had enough participants to detect an association if one truly existed.

A paragraph in the methods section of the article may explain the sample size needed to detect a hypothesized difference in outcomes. You may also find a discussion of power in the discussion section (such as the study had 85 percent power to detect a 20 percent increase in the rate of an outcome of interest, with a 2-sided alpha of 0.05). Sometimes estimates of variance and/or estimates of effect size are given, instead of sample size calculations. In any of these cases, the answer would be "yes."

However, observational cohort studies often do not report anything about power or sample sizes because the analyses are exploratory in nature. In this case, the answer would be "no." This is not a "fatal flaw." It just may indicate that attention was not paid to whether the study was sufficiently sized to answer a prespecified question—i.e., it may have been an exploratory, hypothesis-generating study.

Question 6. Exposure assessed prior to outcome measurement

This question is important because, in order to determine whether an exposure causes an outcome, the exposure must come before the outcome.

For some prospective cohort studies, the investigator enrolls the cohort and then determines the exposure status of various members of the cohort (large epidemiological studies like Framingham used this approach). However, for other cohort studies, the cohort is selected based on its exposure status, as in the example above of depressed diabetic men (the exposure being depression). Other examples include a cohort identified by its exposure to fluoridated drinking water and then compared to a cohort living in an area without fluoridated water, or a cohort of military personnel exposed to combat in the Gulf War compared to a cohort of military personnel not deployed in a combat zone.

With either of these types of cohort studies, the cohort is followed forward in time (i.e., prospectively) to assess the outcomes that occurred in the exposed members compared to nonexposed members of the cohort. Therefore, you begin the study in the present by looking at groups that were exposed (or not) to some biological or behavioral factor, intervention, etc., and then you follow them forward in time to examine outcomes. If a cohort study is conducted properly, the answer to this question should be "yes," since the exposure status of members of the cohort was determined at the beginning of the study before the outcomes occurred.

For retrospective cohort studies, the same principal applies. The difference is that, rather than identifying a cohort in the present and following them forward in time, the investigators go back in time (i.e., retrospectively) and select a cohort based on their exposure status in the past and then follow them forward to assess the outcomes that occurred in the exposed and nonexposed cohort members. Because in retrospective cohort studies the exposure and outcomes may have already occurred (it depends on how long they follow the cohort), it is important to make sure that the exposure preceded the outcome.

Sometimes cross-sectional studies are conducted (or cross-sectional analyses of cohort-study data), where the exposures and outcomes are measured during the same timeframe. As a result, cross-sectional analyses provide weaker evidence than regular cohort studies regarding a potential causal relationship between exposures and outcomes. For cross-sectional analyses, the answer to Question 6 should be "no."

Question 7. Sufficient timeframe to see an effect

Did the study allow enough time for a sufficient number of outcomes to occur or be observed, or enough time for an exposure to have a biological effect on an outcome? In the examples given above, if clinical depression has a biological effect on increasing risk for CVD, such an effect may take years. In the other example, if higher dietary sodium increases BP, a short timeframe may be sufficient to assess its association with BP, but a longer timeframe would be needed to examine its association with heart attacks.

The issue of timeframe is important to enable meaningful analysis of the relationships between exposures and outcomes to be conducted. This often requires at least several years, especially when looking at health outcomes, but it depends on the research question and outcomes being examined.

Cross-sectional analyses allow no time to see an effect, since the exposures and outcomes are assessed at the same time, so those would get a "no" response.

Question 8. Different levels of the exposure of interest

If the exposure can be defined as a range (examples: drug dosage, amount of physical activity, amount of sodium consumed), were multiple categories of that exposure assessed? (for example, for drugs: not on the medication, on a low dose, medium dose, high dose; for dietary sodium, higher than average U.S. consumption, lower than recommended consumption, between the two). Sometimes discrete categories of exposure are not used, but instead exposures are measured as continuous variables (for example, mg/day of dietary sodium or BP values).

In any case, studying different levels of exposure (where possible) enables investigators to assess trends or dose-response relationships between exposures and outcomes—e.g., the higher the exposure, the greater the rate of the health outcome. The presence of trends or dose-response relationships lends credibility to the hypothesis of causality between exposure and outcome.

For some exposures, however, this question may not be applicable (e.g., the exposure may be a dichotomous variable like living in a rural setting versus an urban setting, or vaccinated/not vaccinated with a one-time vaccine). If there are only two possible exposures (yes/no), then this question should be given an "NA," and it should not count negatively towards the quality rating.

Question 9. Exposure measures and assessment

Were the exposure measures defined in detail? Were the tools or methods used to measure exposure accurate and reliable—for example, have they been validated or are they objective? This issue is important as it influences confidence in the reported exposures. When exposures are measured with less accuracy or validity, it is harder to see an association between exposure and outcome even if one exists. Also as important is whether the exposures were assessed in the same manner within groups and between groups; if not, bias may result.

For example, retrospective self-report of dietary salt intake is not as valid and reliable as prospectively using a standardized dietary log plus testing participants' urine for sodium content. Another example is measurement of BP, where there may be quite a difference between usual care, where clinicians measure BP however it is done in their practice setting (which can vary considerably), and use of trained BP assessors using standardized equipment (e.g., the same BP device which has been tested and calibrated) and a standardized protocol (e.g., patient is seated for 5 minutes with feet flat on the floor, BP is taken twice in each arm, and all four measurements are averaged). In each of these cases, the former would get a "no" and the latter a "yes."

Here is a final example that illustrates the point about why it is important to assess exposures consistently across all groups: If people with higher BP (exposed cohort) are seen by their providers more frequently than those without elevated BP (nonexposed group), it also increases the chances of detecting and documenting changes in health outcomes, including CVD-related events. Therefore, it may lead to the conclusion that higher BP leads to more CVD events. This may be true, but it could also be due to the fact that the subjects with higher BP were seen more often; thus, more CVD-related

events were detected and documented simply because they had more encounters with the health care system. Thus, it could bias the results and lead to an erroneous conclusion.

Question 10. Repeated exposure assessment

Was the exposure for each person measured more than once during the course of the study period? Multiple measurements with the same result increase our confidence that the exposure status was correctly classified. Also, multiple measurements enable investigators to look at changes in exposure over time, for example, people who ate high dietary sodium throughout the followup period, compared to those who started out high then reduced their intake, compared to those who ate low sodium throughout. Once again, this may not be applicable in all cases. In many older studies, exposure was measured only at baseline. However, multiple exposure measurements do result in a stronger study design.

Question 11. Outcome measures

Were the outcomes defined in detail? Were the tools or methods for measuring outcomes accurate and reliable—for example, have they been validated or are they objective? This issue is important because it influences confidence in the validity of study results. Also important is whether the outcomes were assessed in the same manner within groups and between groups.

An example of an outcome measure that is objective, accurate, and reliable is death—the outcome measured with more accuracy than any other. But even with a measure as objective as death, there can be differences in the accuracy and reliability of how death was assessed by the investigators. Did they base it on an autopsy report, death certificate, death registry, or report from a family member? Another example is a study of whether dietary fat intake is related to blood cholesterol level (cholesterol level being the outcome), and the cholesterol level is measured from fasting blood samples that are all sent to the same laboratory. These examples would get a "yes." An example of a "no" would be self-report by subjects that they had a heart attack, or self-report of how much they weigh (if body weight is the outcome of interest).

Similar to the example in Question 9, results may be biased if one group (e.g., people with high BP) is seen more frequently than another group (people with normal BP) because more frequent encounters with the health care system increases the chances of outcomes being detected and documented.

Question 12. Blinding of outcome assessors

Blinding means that outcome assessors did not know whether the participant was exposed or unexposed. It is also sometimes called "masking." The objective is to look for evidence in the article that the person(s) assessing the outcome(s) for the study (for example, examining medical records to determine the outcomes that occurred in the exposed and comparison groups) is masked to the exposure status of the participant. Sometimes the person measuring the exposure is the same person conducting the outcome assessment. In this case, the outcome assessor would most likely not be blinded to exposure status because they also took measurements of exposures. If so, make a note of that in the comments section.

As you assess this criterion, think about whether it is likely that the person(s) doing the outcome assessment would know (or be able to figure out) the exposure status of the study participants. If the answer is no, then blinding is adequate. An example of adequate blinding of the outcome assessors is to create a separate committee, whose members were not involved in the care of the patient and had no information about the study participants' exposure status. The committee would then be provided with copies of participants' medical records, which had been stripped of any potential exposure information or personally identifiable information. The committee would then review the records for prespecified outcomes according to the study protocol. If blinding was not possible, which is sometimes the case, mark "NA" and explain the potential for bias.

Question 13. Followup rate

Higher overall followup rates are always better than lower followup rates, even though higher rates are expected in shorter studies, whereas lower overall followup rates are often seen in studies of longer duration. Usually, an acceptable overall followup rate is considered 80 percent or more of participants whose exposures were measured at baseline. However, this is just a general guideline. For example, a 6-month cohort study examining the relationship between dietary sodium intake and BP level may have over 90 percent followup, but a 20-year cohort study examining effects of sodium intake on stroke may have only a 65 percent followup rate.

Question 14. Statistical analyses

Were key potential confounding variables measured and adjusted for, such as by statistical adjustment for baseline differences? Logistic regression or other regression methods are often used to account for the influence of variables not of interest.

This is a key issue in cohort studies, because statistical analyses need to control for potential confounders, in contrast to an RCT, where the randomization process controls for potential confounders. All key factors that may be associated both with the exposure of interest and the outcome—that are not of interest to the research question—should be controlled for in the analyses.

For example, in a study of the relationship between cardiorespiratory fitness and CVD events (heart attacks and strokes), the study should control for age, BP, blood cholesterol, and body weight, because all of these factors are associated both with low fitness and with CVD events. Well-done cohort studies control for multiple potential confounders.

Some general guidance for determining the overall quality rating of observational cohort and cross-sectional studies

The questions on the form are designed to help you focus on the key concepts for evaluating the internal validity of a study. They are not intended to create a list that you simply tally up to arrive at a summary judgment of quality.

Internal validity for cohort studies is the extent to which the results reported in the study can truly be attributed to the exposure being evaluated and not to flaws in the design or conduct of the study—in other words, the ability of the study to draw associative conclusions about the effects of the exposures being studied on outcomes. Any such flaws can increase the risk of bias.

Critical appraisal involves considering the risk of potential for selection bias, information bias, measurement bias, or confounding (the mixture of exposures that one cannot tease out from each other). Examples of confounding include co-interventions, differences at baseline in patient characteristics, and other issues throughout the questions above. High risk of bias translates to a rating of poor quality. Low risk of bias translates to a rating of good quality. (Thus, the greater the risk of bias, the lower the quality rating of the study.)

In addition, the more attention in the study design to issues that can help determine whether there is a causal relationship between the exposure and outcome, the higher quality the study. These include exposures occurring prior to outcomes, evaluation of a dose-response gradient, accuracy of measurement of both exposure and outcome, sufficient timeframe to see an effect, and appropriate control for confounding—all concepts reflected in the tool.

Generally, when you evaluate a study, you will not see a "fatal flaw," but you will find some risk of bias. By focusing on the concepts underlying the questions in the quality assessment tool, you should ask yourself about the potential for bias in the study you are critically appraising. For any box where you check "no" you should ask, "What is the potential risk of bias resulting from this flaw in study design or execution?" That is, does this factor cause you to doubt the results that are reported in the study or doubt the ability of the study to accurately assess an association between exposure and outcome?

The best approach is to think about the questions in the tool and how each one tells you something about the potential for bias in a study. The more you familiarize yourself with the key concepts, the more comfortable you will be with critical appraisal. Examples of studies rated good, fair, and poor are useful, but each study must be assessed on its own based on the details that are reported and consideration of the concepts for minimizing bias.

Paper two: Attachment Security and Suicidality: the mediating role of reflective functioning

Paper two is an original empirical research study that has examined the role reflective functioning in the relationship between attachment and suicidal ideation.

This paper has been prepared for submission to Behaviour Research and Therapy (BRaT) in accordance to the journal guidance for authors (appendix A). As instructed, the referencing style is in accordance with the American Psychological Association (6th Edition). However, specific manuscript preparation guidelines were outlined in the BRaT author guidance and these were adhered to rather APA standards.

BRaT guidance does not specifically state a recommended word count for regular articles; therefore, in accordance with the ClinPsyD Handbook the word count is limited to 8,000 words.

Main Text Word Count: 7553 (excluding abstract, tables, figures, bibliography and appendices)

Attachment Security and Suicidality: the Mediating Role of Reflective Functioning

Jessica Green

Division of Psychology and Mental Health

Faculty of Biology, Medicine and Health

University of Manchester

Author Note

This research was submitted to the University of Manchester for the degree of Doctor of Clinical Psychology (ClinPsyD)

Corresponding Author:

Jessica Green

Trainee Psychologist

Faculty of Biology, Medicine and Health

The University of Manchester

2.01 2nd Floor Zochonis Building

Brunswick Street

Manchester

M13 9PL

Tel: +44 (0) 161 306 0400

Email: jessica.green@postgrad.manchester.ac.uk

Abstract

Background. To understand why attachment difficulties predispose individuals to suicidal ideation and behaviour, we need explore the role of psychological mechanisms in this relationship. Attachment processes are closely linked to the development of mentalization capabilities, or Reflective Functioning; the ability to understand and interpret self and other behaviour as an expression of mental states. However, reflective functioning has rarely been investigated in relation to suicidality.

Method. Sixty-seven participants completed self-report measures of adult attachment, suicidal ideation, reflective functioning, depressive symptomology and hopelessness. Partial correlations, mediation analyses and group comparisons were conducted to explore relationships between these factors.

Results. Findings did not support a mediational role for reflective functioning in the relationship between attachment and suicidal ideation. Several theoretical and methodological explanations are considered and discussed. A direct relationship was established between attachment avoidance and suicidal ideation, after controlling for age, gender and depressive symptoms. However, participants with a history of attempted suicide were higher in anxious attachment compared to participants with no such history.

Conclusions. Our results indicate that suicide attempters are more likely to be anxiously-attachment, where those currently experiencing suicidal ideation are most likely to high in attachment avoidance. Longitudinal and experimental designs are required to verify causality.

Keywords

Adult attachment, Suicide, Reflective Functioning, Mentalization, Mediation

Highlights

- Explored the role of reflective functioning between attachment and suicide
- Only avoidant attachment was associated with increased suicidal ideation
- No mediational effect was found for reflective functioning
- Participants with a history of suicide attempts reported higher attachment anxiety

Introduction

Suicidal behaviour is a major global health concern. Each year, approximately 800,000 people die by suicide, making it the leading cause of death worldwide among 15-29 year olds (World Health Organisation, 2018). In 2016, 5965 suicides were registered in the UK, with the highest proportion in males aged 40-44 years (Office of National Statistics, 2017). As suicide is the result of a person taking actions to end their own life it is perhaps the cause of death most directly affected by psychological factors. Therefore, improving our understanding of the psychological processes that underpin suicidality (i.e. ideation, attempts or death) is essential for early identification of risk and development of effective psychotherapeutic interventions.

Psychological Models of Suicide

Although the causes of suicide are not fully understood, it is generally accepted that suicidal thoughts and behaviours result from the complex interplay of many factors (O'Connor & Nock, 2014). Psychological explanations have been developed to improve our understanding of suicide; with the majority being diathesis-stress models with a cognitive focus (e.g. Baumeister, 1990; Johnson, Gooding, & Tarrier, 2008; O'Connor, 2011; Schotte & Clum, 1987; Williams, 1997, 2001). Other explanations have emphasised the central role of social connectedness. Early sociological explorations posited a lack of social integration increases the likelihood of suicide (Durkheim, 1897), and the more contemporary Interpersonal-Psychological Theory of Suicidal Behaviour (IPT; Joiner, 2005; Van Orden et al., 2010) proposed social alienation (low belongingness) contributes to individuals developing suicidal desires. However, theorists have tended to overlook developmental perspectives, for example, how attachment security may contribute to disruptions in relationships and increases in suicide risk.

Attachment Theory

Attachment theory is a useful framework for understanding how early experiences of caregiving shape future feelings of security and behaviour in interpersonal relationships. Bowlby (1969) proposed that children who receive responsive and consistent care develop secure mental representations (or internal working models) of others as available and supportive, and themselves as loved and capable. In contrast, infants who experience care that is insensitive, inconsistent or rejecting will learn to view others as unavailable or unpredictable, and themselves as unlovable. Through repeated interactions these representations become entrenched, and guide how infants activate their attachment system in times of danger or distress, and their expectations of future interpersonal exchanges (Main, Kaplan, & Cassidy, 1985).

Bowlby's work was extended by Ainsworth and colleagues (1971; 1978) who, in addition to secure attachment, identified two distinct styles of insecure attachment: anxious and avoidant. Whereas secure infants activate their attachment system appropriately upon separation and quickly return to baseline, anxious children maximise their distress signals and are difficult to soothe when reunited. In contrast, avoidant infants display minimal distress and shift their attention away from their mother when she returns. Main and Hesse (1990) later identified a fourth behavioural pattern; disorganised attachment. The confused, undirected and inconsistent behaviour exhibited by these infants is understood to be a fearful response to a frightening caregiver; where the child had developed incompatible views of their primary caregiver as both a source of danger, and a source of protection.

Research across the lifespan indicates that these internal representations and attachment styles remain moderately stable into adulthood (Fraley, 2002). Adult attachment theory assumes that patterns developed in the context of parent-child

relationships translate into similar styles of relating in the context of romantic relationships (Hazan & Shaver, 1987). Extending this, Bartholomew and Horowitz (1991) proposed a four-factor model that parallels the categories observed in infants. Depending on whether adults view themselves and others as positive or negative, they can be categorised as secure, preoccupied, dismissing or fearful. However, there has been a move in recent years towards conceptualising attachment differences on dimensions rather than categories (Brennan, Clark, & Shaver, 1998). Individuals high in attachment avoidance are uncomfortable with closeness in relationships and over-value independence, whereas those high in attachment anxiety strongly desire close relationships yet have an intense fear of abandonment. Individuals low in both attachment anxiety and avoidance are securely attached; they feel close to significant others and can rely on them in times of need.

Attachment Security and Suicide Risk

Adams (1994) put forward a developmental model that conceptualised suicide as an extreme attachment behaviour, signalling distress and anger towards an inconsistent or unavailable attachment figure. This model proposed that when experiencing current threat or distress, individuals with trait vulnerabilities of anxious or avoidant attachment are unable to draw on resources from interpersonal relationships as efficiently as their securely attached peers, and instead resort to suicidal thinking or behaviour as their crisis escalates. Furthermore, insecurely attached individuals will have greater sensitivity to interpersonal threat such as loss, disappointment and rejection, which will lead to more frequent activation of their attachment system. For avoidant individuals, suicide may be the eventual outcome of a deactivated attachment system, where they have become socially isolated because of avoiding close relationships and eventually rejecting life itself (Miniati, Callari, & Pini, 2017). Alternatively, anxiously attached individuals, who crave

closeness but fear abandonment, may resort to suicidal gestures and behaviours to elicit care and support from others in the absence of more adaptive strategies.

Empirical research has reliably demonstrated that attachment insecurity is a general risk factor for many psychological difficulties (Mickelson, Kessler, & Shaver, 1997; Mikulincer & Shaver, 2007a), and there is a growing body of literature which supports a relationship between insecure attachment and suicide-related outcomes. This has been evidenced in research with adolescents (Adams, Sheldon-Keller, & West, 1996; de Jong, 1992; Sheftall, Mathias, Furr, & Dougherty, 2013), adults (McKeown, Clabour, Heron, & Thomson, 2016; Nye et al., 2009; Palitsky, Mota, Afifi, Downs, & Sareen, 2013), and for suicidal ideation (Davaji, Valizadeh, & Nikamal, 2010; Lessard & Moretti, 1998) and attempts (Grunebaum et al., 2010; Lizardi et al., 2011; Palitsky et al., 2013; Sheftall, Schoppe-Sullivan, & Bridge, 2014). A recent review of sixteen studies examining adult attachment and suicidal ideation and attempts found predominately anxious styles were associated with an increased suicide risk, and concluded that suicidality is the result of an interaction between long-lasting insecure attachment patterns and current symptoms of various psychopathologies (Miniati et al., 2017).

However, to better understand why attachment difficulties predispose individuals to suicidal ideation and behaviour, we need to examine psychological mechanisms that are theoretically proposed to mediate this association. Exploratory research has begun to investigate psychological constructs that may bridge this gap, including interpersonal problems (Stepp et al., 2008), self-criticism and dependency (Falgares et al., 2017), loneliness (Levi-Belz, Gvion, Horesh, & Apter, 2013) and feelings of entrapment (Cohen, Ardalan, Yaseen, & Galynker, 2017; Li et al., 2017). Yet this is an emerging body of literature with minimal consensus or underpinning theoretical models. Adams' (1994) model outlines a number of psychological factors that could intervene between attachment

security and later suicidal behaviour, including personal vulnerability and resilience factors and skill deficits that are a potential consequence of adverse parenting experiences. However, since its development further theoretical advances have been made that may have been overlooked in the original conceptualisation.

Reflective Functioning as a Mediator

One psychological construct that is intimately linked with attachment is mentalization; operationalised by Fonagy and colleagues as ‘reflective functioning’ (Fonagy & Bateman, 2016; Fonagy, Gergely, Jurist, & Target, 2002). Mentalization, or reflective functioning (used synonymously), refers to the human capacity to understand and interpret one’s own behaviour, and the behaviour of others, as expressions of mental states such as thoughts, feelings, beliefs and desires (Fonagy et al., 2002). Having the ability to form relatively accurate models of the mind, whilst acknowledging the opaqueness of mental states, helps individuals understand and anticipate one another’s actions (Fonagy et al., 2016; Fonagy & Target, 1997). It is a vital skill that allows people to successfully navigate their social world and regulate their affect (Fonagy et al., 2002), and impairments in mentalizing have been implicated in a wide range of psychological disorders (Katznelson, 2014).

Refinement of this skill and its robustness in highly distressing emotional interactions is influenced by early attachment experiences (Fonagy et al., 2002). To develop mentalizing skills, children need to experience sensitive and attuned care from somebody who has their mind in mind (mind-mindedness; Meins et al., 2002). This provides the context for infants to become sensitised to their own inner self-states, and the mental states of others. As reflective functioning develops, others’ behaviour becomes more predictable and meaningful, which enables individuals to respond flexibly and adaptively to interpersonal interactions (Fonagy & Target, 1997). An abusive or neglectful

early environment, which often underpins insecure attachment, can disrupt the acquisition of important mentalizing skills (Fonagy et al., 2002; Fonagy & Target, 1997).

Furthermore, adults with insecure attachment continue to show fluctuations in their capacity to mentalize, especially when their attachment system is aroused (Fonagy & Luyten, 2009).

Contemporary theories have largely focused on attachment disruptions and mentalization deficits in relation to Borderline Personality Disorder (BPD). Fonagy and colleagues' (2009) mentalization-based model postulates that distal (attachment disruptions) and proximal risk factors (stress and arousal) interact to lower a person's threshold for activation of their attachment system, and subsequent deactivation of their mentalizing capabilities. When mentalization skills are 'switched-off' individuals become vulnerable to the core features of BPD; affect dysregulation, poor impulse control, dysfunctional relationships, dissociation and feelings of inner pain and emptiness (Fonagy & Bateman, 2008; Fonagy & Luyten, 2009). Many of these core features have been established as key risk factors for suicide (Klonsky & May, 2010; Troister & Holden, 2012; Weinberg & Klonsky, 2009) and there are similarities between Fonagy and colleagues' conceptualisation of BPD and Adams' (1994) developmental model of suicide. In the context of Adams' model, mentalization impairments would be understood as a consequence of insecure attachment that increases vulnerability to suicidal thinking and behaviour when coupled with acute stress or interpersonal difficulties. Moreover, a study of BPD patients found that those who received mentalization-based treatment to improve their reflective functioning had significantly fewer suicide attempts over an 8-year follow up period compared to those who received treatment as usual (Bateman & Fonagy, 2008). This suggests that impaired reflective functioning may be partly responsible for increased

suicidal behaviours, and more importantly, that risk could be reduced through effective psychological intervention.

In a review of reflective functioning, Katznelson (2014) found mentalization impairments to associate with various forms of psychopathology. However, there is a shortage of research that has explicitly investigated the link between reflective functioning and suicidal thoughts or behaviour. Studies that have attempted to explore this association have assessed conceptually-related constructs as a proxy for reflective functioning (e.g. Alexithymia, Theory of Mind) which limits the validity of their conclusions (Andersson & Berggren, 2012; Duno et al., 2009). Research efforts may have been hampered by the fact that until recently assessment of reflective functioning relied on administering and rating the Adult Attachment Interview (AAI; George, Kaplan, & Main, 1996); an expensive and time-consuming assessment process (Katznelson, 2014). However, the recent development of the Reflective Functioning Questionnaire (RFQ; Fonagy et al., 2016), a brief self-report measure of mentalizing, should enable more valid and convenient measurement of this complex psychological variable.

Present Study

Based on the previous theoretical arguments and empirical findings, the present study aimed to further verify the relationship between adult attachment security and suicidality, and examine the potential mediating role of reflective functioning. Suicidal ideation was chosen as the primary outcome variable as it is more prevalent in the general population (Nock et al., 2008) and a key risk factor for eventual suicide (Brown, Beck, Steer & Grisham, 2000). Approximately one third of individuals who experience suicidal thoughts go on to attempt suicide, and 60% of transitions from ideation to attempt occur within the first year of ideation onset (Nock et al., 2008). Furthermore, the severity of ideation is associated with a higher likelihood of future suicidal behaviour (Lewinshohn,

Rohde, & Steely, 1996). Suicidal thinking also causes significant distress in its own right; experiencing enduring suicidal ideation has been shown to increase the likelihood of impaired psychosocial and mental functioning in young adulthood (Steinhausen & Winkler Metzke, 2004). Therefore, it is imperative that we better understand the psychological mechanism that underpin this relevant precursor in order to prevent impaired psychosocial functioning and subsequent suicidal behaviour.

In addition to the primary mediation analyses, additional analyses were also carried out to investigate individual differences between participants based on their self-reported histories of suicide attempts. Our specific hypotheses were:

H1: Anxious and avoidant attachment will be positively associated with suicidal ideation; participants scoring higher on self-report measures of these attachment dimensions will also score higher on a measure of recent suicidal ideation, after adjustments have been made for key sociodemographic and psychological variables.

H2: The relationship between attachment security and suicidal ideation will be mediated by deficits in reflective functioning.

H3: Participants with a self-reported history of attempted suicide will score higher on measures of attachment security and reflective functioning.

Method

Research Context

The current study formed part of The CLoseness to Others and Suicidal Experiences (CLOSE) project; a collaborative research project at the University of Manchester. As such, not all measures administered to participants are reported in the current study. The research protocol described here was reviewed and approved by the

North West – Greater Manchester West NHS Research Ethics Committee (appendix B; Ref #17/NW/0194) and the Health Research Authority (appendix C).

Sampling Procedure

An opportunity sampling method was employed and participants were recruited via clinician- and self- referrals.

Participants identified through the National Health Service (NHS) were recruited from two trusts in the North-west of England. Recruitment efforts were targeted at Secondary care and Inpatient psychiatric services, as individuals accessing these services are more likely to have an increased risk for suicidal ideation. NHS clinicians shared information about the project with eligible patients and sought consent for a researcher to approach them in person or via telephone. Patients could also self-refer to the project using contact details provided by their clinician, or from posters and leaflets displayed at approved NHS sites.

Study advertisements were also displayed in third-sector voluntary organisations and public places (e.g. University of Manchester campus). Participants who self-referred to the study were required to provide contact details of a responsible clinician so any risk concerns arising from participation could be shared if required.

Inclusion Criteria

The primary inclusion criterion was self-reported suicidal ideation within the past year. A positive response to the screening question ‘have you had any thoughts of killing yourself in the past 12 months’ was used to confirm eligibility. Participants were also asked ‘approximately, when was the last time you had any thoughts of killing yourself?’ to gather information on the recency of their suicidal ideation. Further inclusion criteria included being 18 years or above, having sufficient English language proficiency and having capacity to provide informed consent as established through clinical observations

at the time of interview. Exclusion criteria included a primary organic mental disorder (e.g. traumatic brain injury, dementia) and significant substance use resulting in intoxication at the time of interview.

No financial or alternative incentive was offered for taking part.

Study Procedure

Once identified as eligible, a researcher met with the potential participant to provide more information and answer any questions. After allowing sufficient time to read and consider the information sheet, interested participants were assisted through the consent process. Participants were given the option to complete the questionnaires independently or with assistance from the researcher.

Upon completion, participants were provided with a debriefing sheet and given the opportunity to discuss and reflect on the experience. All participants were provided with a support sheet outlining crisis advice and contact information, and were encouraged to speak to a member of their care team or responsible clinician if they felt any distress following the study. Any risk concerns arising during participation were handed over to a member of the participant's care team.

Measures

In total, seven measures and a sociodemographic questionnaire developed for the study (Appendix D) were administered to participants. Measures were counterbalanced to reduce order effects. The measures included in the current study are described below.

Outcome Variables

The Beck Scale for Suicidal Ideation (BSSI; Beck, Kovacs, & Weissman, 1979) is a 21-item self-report measure that assesses suicidal thinking and planning over the past week. Each item has three response options (e.g., 'I have no wish to die', 'I have a weak wish to die', or 'I have a moderate to strong wish to die') which are scored from 0-2.

Typically, the first five items are used as screening questions in non-clinical samples. However, in the current sample, participants were asked to respond to all items. Responses to items 1-19 were summed to provide a total ideation score ranging from 0 – 38, with a higher score indicating more severe suicidal thinking. Items 20 and 21 indicate whether the respondent has a history of suicide attempt(s), and were not included in the total ideation score. The BSSI has demonstrated excellent internal consistency in a clinical sample of mood disorder patients ($\alpha = .97$) (Beck, Steer, & Ranieri, 1988).

Predictor Variables

The Revised Experiences in Close Relationships Scale (ECR-R; Fraley, Waller, & Brennan, 2000) is a 36-item self-report measure of adult attachment security. Respondents rate on a 7-point Likert scale their agreement with statements about how they generally experience close relationships. The questionnaire includes two sub-scales that assess dimensions of attachment-related security; avoidance and anxiety (18 items each). Items that make up the anxiety subscale (e.g. ‘I worry about being abandoned’) measure the extent to which individuals fear abandonment, have a negative self-view and are highly preoccupied with romantic partners. Alternatively, items that measure attachment avoidance (e.g. ‘I prefer not to show a partner how I feel deep down’) measure the degree to which individuals avoid intimacy, view others negatively and do not seek support when required. High scores on either dimension indicate greater attachment insecurity with mean scores ranging from 1 to 7. The ECR-R subscales have been found to have high internal consistency with Cronbach’s α coefficients of near or above .90 (Mikulincer & Shaver, 2007b), and highly stable test-retest reliability (Sibley, Fischer, & Liu, 2005).

The Reflective Functioning Questionnaire (RFQ; Fonagy et al., 2016) is a brief screening measure of mentalization, made up of eight items that participants rate on a 7-point Likert scale ranging from ‘strongly disagree’ to ‘strongly agree’. The scoring

procedure yields two subscales that measure two broad types of impairment; hyper- and hypomentalizing. Six of the eight items are included on both scales but scored differently to capture different failures in mentalization. The Certainty about Mental States (RFQ-C) subscale includes items such as ‘People’s thoughts are a mystery to me’ which are reverse scored to capture extreme levels of certainty. Very low levels of agreement with RFQ-C items reflect distorted, projective mentalizing, or *hypermentalizing*, while some agreement reflects adaptive levels of certainty about mental states. The Uncertainty about Mental States (RFQ-U) subscale includes items such as ‘Sometimes I do things without really knowing why’. High levels of agreement with RFQ-U items reflect an inability to consider complex models of one’s own mind or others, or *hypomentalizing*, whereas lower scores indicate an awareness of the opaqueness of one’s own mental states and those of others, typical of genuine mentalizing. The RFQ-C and RFQ-U subscales have shown acceptable internal consistency (Cronbach’s $\alpha = 0.73$ and 0.78 respectively) in a clinical sample, and have been found to significantly relate in theoretically predicted ways with related constructs of empathy, mindfulness and perspective-taking (Fonagy et al., 2016).

Potential Co-variables

The Beck Hopelessness Scale (BHS; Beck, Weissman, Lester, & Trexler, 1974) is a 20-item self-report inventory that assesses three aspects of hopelessness; negative beliefs about the future, loss of motivation and expectation. Participants rate pessimistic (e.g. ‘my future seems dark to me’) and optimistic (e.g. ‘I look forward to the future with hope and enthusiasm’) items as either true or false in relation to how they have felt in the past week. Items are scored 0 (false) or 1 (true), and positive items are reverse scored. Items are summed to produce a total score ranging from 0-20, with a higher score indicative of a greater severity of hopelessness. The scale has shown excellent internal reliability ($\alpha=.93$)

in clinical samples (Beck et al., 1974), and adequate convergent, discriminant and predictive validity in a meta-analysis (McMillan, Gilbody, Beresford, & Neilly, 2007).

The Patient Health Questionnaire- 9 (PHQ-9; Kroenke, Spitzer, & Williams, 2001) is a brief 9-item self-report measure that assesses depression symptom severity. Respondents are instructed to rate how often they have experienced common symptoms of depression (e.g. feeling down, depressed or hopeless) over the past two weeks, on a four-point Likert scale from 0 (not at all) to 3 (nearly every day). The items are summed to give a total score which can range from 0-27, with a higher score indicative of greater depression severity. The scale has demonstrated good internal reliability ($\alpha = 0.86-0.89$), excellent test-retest reliability and predictive validity for major depression (Kroenke et al., 2001).

Statistical Analysis

Missing Data

Patterns of missing data were explored using the Missing Values Analysis function in IBM SPSS Statistics (v. 23). No missing data were found for the PHQ-9, and only 1 data-point was missing for the RFQ. Little's chi-square statistic was non-significant for the other scales, indicating data were missing completely at random (MCAR). Therefore, Expectation-Maximisation (EM) method, a method of single imputation, was used to estimate and replace small amounts of missing data (< 20% per participant, per scale) to retain the maximum number of participants for analysis.

Univariate Analyses

Bias checks were conducted to assess for outliers and non-normal distribution of data. Descriptive characteristics were calculated for each variable, in addition to partial correlations controlling for age and gender. Where assumptions of univariate normality were violated, 1,000 bootstrapped samples were drawn, and bias corrected 95% bootstrap

confidence intervals (CIs) reported. Bootstrapping is a nonparametric resampling procedure, and is recommended as an alternative to transforming data or other non-parametric tests when parametric assumptions are violated (Field, 2014).

Between-group comparisons based on participant's suicide attempt history were also carried out for each measure. The Kolmogorov-Smirnov test was used to assess within-group data distribution. Where normality was violated the Kruskal-Wallis test was ran as the non-parametric alternative, as the F-statistic reported in an ANOVA cannot be bootstrapped (Field, 2014). Due to the small n and unequal group sizes, it was not appropriate to carry out further analyses with group allocation as the dependent variable.

Mediation Analyses

To assess hypothesis two, that the relationship between attachment security and suicidal ideation is mediated by deficits in reflective functioning, simple mediation models were applied. Mediation analyses were performed using Hayes (2013) PROCESS (2.16.3) model 4 for SPSS. Gender, age and self-reported depressive symptoms were included as covariates in the mediation model to adjust for the potential effects of these factors on both reflective functioning and suicidal ideation. In all cases, 1,000 bootstrapped samples were used to generate a sampling distribution and a 95% confidence interval for the indirect effect; statistical significance of the indirect effect is determined by the absence of zero from the confidence interval (Field, 2014).

Results

Descriptive Statistics

In total, 67 participants completed the questionnaire measures. Two participants were excluded as they reported last experiencing suicidal thoughts over 1 year ago. Therefore, 65 participants were included in the final sample.

Sociodemographic Characteristics

Sociodemographic characteristics of the sample are presented in Table 1. Participants were aged between 18 and 63 years, with a mean age of 32.15 (SD = 12.45) years. The sample were predominantly White British (83.1%), female (69.2%) and currently single (67.7%). Most participants self-reported at least one psychiatric diagnosis, with Mood Disorders (e.g. Depression, Bipolar), Anxiety Disorders (e.g. Anxiety, PTSD, Social anxiety) and Personality Disorders (e.g. Borderline / Emotionally Unstable Personality Type) most commonly reported. Twenty-four participants also reported having a disability (36.9%), which included physical disabilities (e.g. chronic health conditions, mobility impairments), learning difficulties or disabilities (e.g. Mild Learning Disability, Dyslexia and Dyspraxia), Autistic Spectrum Disorders and Mental Health difficulties (when the participant considered this to be a disability).

Questionnaire Measures

Descriptive statistics for all questionnaire measures and the results of normality and reliability tests are reported in Table 2. Sixty-four participants completed all questionnaire measures; 1 participant chose not to complete the ECR-R and RFQ but their data was retained for those questionnaires completed.

The Kolmogorov-Smirnov test was carried on all total scales and subscales to assess for normal distribution. The ECR-R subscale scores for anxious ($D_{(64)} = 0.78$, $p = .200$) and avoidant ($D_{(64)} = 0.76$, $p = .200$) attachment security did not deviate significantly from a normal distribution; however, scores for depression, hopelessness, suicidal ideation, and reflective functioning were all significantly non-normal.

Most total scales and subscales had good-to-excellent internal consistency, as demonstrated by Cronbach's $\alpha = .80 - .94$. The Certainty of Mental States subscale of the RFQ was found to have a reliability score in the acceptable range (Cronbach's $\alpha = .78$).

Table 1. Sociodemographic Characteristics

Sociodemographic Variables	Total N = 65
	N (%)
Gender	
Male	20 (30.8)
Female	45 (69.2)
Ethnicity	
White British	54 (83.1)
White Other	4 (6.2)
Other	7 (10.8)
Educational Attainment, highest level	
None	4 (6.2)
GCSEs or equivalent	12 (18.5)
A Levels or equivalent	26 (40.0)
Undergraduate degree	9 (13.8)
Postgraduate degree	6 (12.3)
Other	8 (12.3)
Current Relationship Status	
Single	44 (67.7)
In a relationship	8 (12.3)
Cohabiting	5 (7.7)
Married	8 (12.3)
Employment Status	
Unemployed	9 (13.8)
Unable to work (due to disability, mental health, sickness)	19 (29.2)
Employed	17 (26.2)
Student	19 (29.2)
Retired	1 (1.5)
Self-reported Psychiatric Diagnosis ^a	
None / Not stated	11 (16.9)
Anxiety Disorder	24 (39.6)
Mood Disorder	37 (56.9)
Personality Disorder	14 (21.5)
Psychotic Disorder	10 (15.4)
Other	4 (6.2)
Self-reported Disability ^a	
None	41 (63.1)
Physical	10 (15.4)
Learning Disability / Difficulty	4 (6.2)
Autistic Spectrum Disorder	4 (6.2)
Mental Health	11 (16.9)
Other	1 (1.5)

^a Participants could report more than one diagnosis/disability therefore the total % may exceed 100

Suicidality

Participants self-reported on a single-item measure the recency of their suicidal ideation. Forty-five participants reported experiencing suicidal thoughts within the past month (69.2%). Three quarters of the sample also reported a lifetime history of attempted suicide (73.8%), as measured by item 20 on the BSSI. Of the 48 participants who reported a past suicide attempt, 29 (60.4%) reported having attempted suicide on multiple occasions.

Table 2. Questionnaire Measures: Descriptive statistics, normality and reliability tests

	Mean (SD)	Range	Kolmogorov-Smirnov test		Cronbach's Alpha
			Statistic	Sig. level	α
Suicidal ideation	14.23 (9.87)	0 – 35.00	.133	.006	.943
Depression	15.87 (7.38)	0 – 27.00	.127	.011	.887
Hopelessness	12.09 (6.49)	0 – 20.29	.145	.002	.940
Anxious Attachment ^a	4.21 (1.42)	1.06 – 6.61	.078	.200	.934
Avoidant Attachment ^a	3.80 (1.44)	1.11 – 6.67	.076	.200	.935
Certainty of Mental State ^a	0.66 (.74)	0 – 2.83	.186	<.001	.778
Uncertainty of Mental States ^a	1.36 (.88)	0 – 3.00	.112	.044	.800

^a $n = 64$ due to missing questionnaire data that could not be reliability imputed

Correlational Analyses

Partial correlations were carried out between all study variables using Pearson product-moment correlation coefficients, controlling for age and gender (Table 3). To account for non-normal distributions of data, bias corrected and accelerated (BCa) bootstrap 95% confidence intervals are reported in square brackets.

Table 3. Partial Correlations, Controlling for Age and Gender

	Hopelessness	Depression ^a	Anxious Attachment	Avoidant Attachment	Hypermentalizing	Hypomentalizing
Suicidal ideation	.709** [.586, .815]	.479** [.305, .629]	.222 [-.077, .495]	.364** [.128, .576]	-.090 [-.359, .166]	.238 [-.037, .480]
Hopelessness		.604** [.414, .736]	.273* [.030, .494]	.316* [.106, .528]	-.119 [-.389, .142]	.226 [-.033, .452]
Depression ^a			.256* [.030, .449]	.249 [-.003, .466]	-.129 [-.350, .101]	.231 [-.005, .454]
Anxious Attachment				.358** [.121, .562]	-.224 [-.472, .022]	.599** [.395, .747]
Avoidant Attachment					.090 [-.183, .304]	.204 [-.068, .448]
Hypermentalizing						-.610** [-.742, -.462]

BCa bootstrap 95% CIs reported in brackets; * $p < .05$, ** $p < .01$.

^a Partial Correlation Analyses were repeated following the removal of item nine from the depression scale(PHQ-9) which enquires about recent thoughts of self-harm. This was not found to impact the results.

Moderate to strong positive correlations were found between measures of recent suicidal ideation, hopelessness and depression. Weaker, yet statistically significant relationships with anxious attachment were found for current depression ($r = .26$) and hopelessness ($r = .27$). Anxious attachment and suicidal ideation were not significantly correlated once age and gender had been controlled for ($r = .22$). Conversely, a significant moderate relationship was found between avoidant attachment security and suicidal ideation ($r = .36$), but the relationship between attachment avoidance and depression did not reach significance ($r = .25$, $BCa\ 95\% CI = -.003, .446$). Certainty of mental states, or Hypermentalizing, was not found to significantly relate to any of the other psychological variables. A moderate correlation was found between anxious attachment and uncertainty of mental states ($r = .599$, $p < .01$), which was also found to weakly correlate with suicidal ideation, but this was not significant after controlling for age and gender ($r = .24$, $p = .062$).

Mediation Analyses

Guided by Hayes and Rockwood (2017), the criteria required for establishing mediation as described by Baron and Kenny (1986) was not considered necessary for carrying out mediation analyses. As hypermentalizing was not found to significantly associate with any of the variables of interest at the bivariate level, it was not explored further as a mediating variable. However, although hypomentalizing did not correlate at a significant level with suicidal ideation ($r = .24$) or avoidant attachment ($r = .20$) these coefficients suggest a small effect in the hypothesised direction. Therefore, an indirect effect on attachment on suicidal ideation through reflective functioning is plausible through a sequence of steps where attachment affects reflective functioning, which in turn affects suicidal ideation.

Table 4. Mediation of attachment security effects on suicidal ideation via hypomentalizing, controlling for age and gender

Independent Variable (Attachment Dimension)	Path a	Path b	Total effect (c):	Direct Effect (c')	Indirect Effect	Sobel Test: z-score (p value)
Anxious	.36 [.23, .48]	1.87 [-1.71, 5.46]	1.51 [-.20, 3.22]	.84 [-1.30, 2.98]	.69 [-.64, 1.93]	1.01 (.31)
<i>(controlling for depression)^a</i>	.34 [.22, .47]	1.26 [-2.00, 4.52]	.72 [-.87, 2.32]	.29 [-1.67, 2.25]	.43 [-.99, 1.50]	.75 (.45)
Avoidant	.12 [-.03, .26]	1.95 [-.83, 4.73]	2.39 [.81, 3.96]	2.16 [.56, 3.75]	.23 [-.08, 1.02]	.96 (.34)
<i>(controlling for depression)^a</i>	.09 [-.06, .24]	1.10 [-1.50, 3.71]	1.71 [.23, 3.19]	1.61 [.108, 3.12]	.09 [-.14, .84]	.574 (.57)

BCa bootstrapped 95% CIs reported in brackets

^a Mediation Analyses were repeated following the removal of item nine from the depression scale(PHQ-9) which enquires about recent thoughts of self-harm. This was not found to impact the results.

When anxious attachment was entered as the independent variable, a significant positive relationship was found with the mediating variable hypomentalization after adjusting for age, gender and depression symptoms ($b=.34, p < .001$, BCa CI [.22, .47]). However, there was no significant total, direct or indirect effect of anxious attachment on suicidal ideation (Table 4). When avoidant attachment was entered as the independent variable (fig. 1), no significant coefficients were revealed between avoidant attachment and hypomentalizing (path a, $p = .11$) or between hypomentalizing and suicidal ideation (path b, $p = .11$). However, the total effects model was significant, as was the direct effect model once the explanatory mediating variable was added ($b = 1.61, p = .04$, BCa CI [.108, 3.12]). Yet, the absence of a significant indirect effect ($b = .10$, 95% CI [-.07, .99]) confirms that this direct relationship is not mediated by increased hypomentalization.

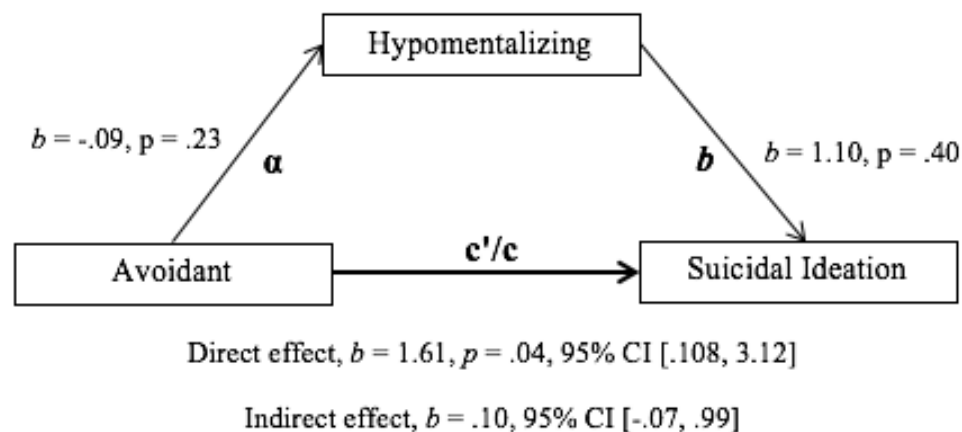


Fig. 1. Mediation model with avoidant attachment as the independent variable, hypomentalizing as mediator and suicidal ideation score as dependant variable. Controlling for age, gender and current depression.

Mean Comparisons

Mean comparisons were conducted to compare psychological variables across participants who self-reported a history of suicide attempts never, once or multiple times. Due to a high proportion of the data demonstrating non-normal within-group distribution, the non-parametric Kruskal-Wallis test was run for all analyses. Means, standard deviations, test statistics and pairwise comparisons are presented in Table 5. Significant differences between groups were found for measures of depression, hopelessness, suicide ideation, and the anxious insecurity and hypomentalizing subscales. For these constructs, pairwise comparisons were carried out to explore where significant differences lie between groups, and calculated effect sizes and adjusted p-values are reported in Table 5.

A consistent pattern was found for recent depressive symptoms, feelings of hopelessness and suicidal ideation. Participants who reported one past attempt were not found to statistically differ from those with no attempt history. However, participants who reported a history of multiple suicide attempts reported significantly more depressive symptoms, feelings of hopeless and suicidal thoughts than both single and never attempters.

Individuals who reported multiple past suicide attempts were found to have greater anxious attachment insecurity compared to those who reported no such history ($d = .47$, $adj. p = .004$), but there was no statistical difference between multiple and single attempters ($d = .11$, $adj. p = 1.000$). When comparing single to never attempters, there was a trend towards single attempters being more anxiously attached, but this was not significant when adjustments were made for multiple comparisons ($p = 0.26$, $adj. p = .077$). For avoidant attachment, observing the group means revealed a similar gradual increase in insecurity across the three groups with multiple and never attempts being the

Table 5. Differences between participants with multiple previous suicide attempts, one previous attempt or no previous attempts

	Descriptive Statistics			Kruskal-Wallis		Pairwise Comparisons		
	Never (n=17)	Once (n=19)	Multiple (n=29)	H Statistic	Sig.	Never Once	Never Multiple	Once Multiple
Suicide Ideation ^a	9.94 (6.93)	9.58 (6.40)	19.15 (10.61)	12.15	.002	-.021	.416*	-.447**
Hopelessness	9.84 (5.42)	9.87 (6.21)	14.85 (6.36)	11.06	.004	-.005	-.398*	-.408*
Depression	13.53 (8.20)	13.37 (7.59)	18.90 (5.67)	8.81	.012	-.006	-.355*	-.365*
Attachment ^b								
Anxious	3.32 (1.16)	4.38 (1.18)	4.64 (1.50)	10.37	.006	-.372	-.474**	-.114
Avoidant	3.03 (1.02)	3.71 (1.51)	4.23 (1.42)	5.39	.068	-	-	-
Reflective Functioning ^b								
Certainty	.59 (.49)	.69 (.73)	.47 (.62)	1.59	.451	-	-	-
Uncertainty	.82 (.49)	1.34 (.89)	1.63 (.91)	6.431	.040	-.223	-.377*	-.163

^a $n = 16$ for never attempt group due to exclusion of an extreme outlier; ^b $n = 28$ for multiple attempt group due to missing questionnaire data; * $p < .05$, ** $p < .01$

most disparate. However, there was no statistically significant difference between the three groups ($H = 5.39$, $p = .068$) and therefore pairwise comparisons were not conducted.

A similar pattern of results was also found for reflective functioning; multiple attempters were significantly more likely to report uncertainty about their own and others' mental states compared to never attempters ($d = -.377$, $\text{adj. } p = .004$) but not compared to participants with a history of one past attempt ($d = -.114$, $\text{adj. } p = 1.000$). Likewise, there was no significant difference between single and never attempters once adjustments were made for multiple comparisons ($p = .026$, $\text{adj. } p = .077$). For extreme certainty about mental states, i.e. hypermentalizing, no statistical difference or observable trend was found between groups based on their attempt history ($H = 1.59$, $p = .45$).

Discussion

The aim of the current study was to explore the role of a theoretically determined mediator in the attachment-suicide relationship. More specifically, it was hypothesised that impairments in mentalization, the ability to understand and interpret actions as expressions of mental states, would bridge the gap between attachment insecurity and suicidal ideation. Overall, the present results did not provide evidence that mentalization deficits mediate a relationship between attachment insecurity and suicidal ideation. However, several interesting findings emerged that will be discussed in relation to the initial hypotheses.

Hypothesis 1

The main significant finding was the direct relationship between attachment avoidance and recent suicidal ideation, which remained significant after controlling for age, gender, and recent symptoms of depression. This was not found for attachment anxiety, suggesting that being uncomfortable with relational intimacy and over-valuing

independence puts individuals at greater risk for experiencing suicidal thoughts. This contradicts a recent review that found mostly anxious-attachment styles to associate with suicidality (Miniati et al., 2017). Likewise, preoccupied, fearful or unresolved-disorganised attachment styles, which all reflect a degree of attachment-anxiety, have generally been associated with greater suicidal ideation compared to dismissive styles (Lessard & Moretti, 1998; Riggs & Jacobvitz, 2002). However, a large population-based study demonstrated that scoring high on either dimension increased risk for suicidal ideation (Palitsky et al., 2013), and research employing a longitudinal design found only avoidant attachment to predict suicide ideation at 3-month follow up (Grunebaum et al., 2010). Therefore, rather than one attachment-related difficulty inferring greater risk it is likely that other factors influence these longitudinal pathways.

A case-comparison of adolescent inpatients in the mid- 1990s found anxious-related attachment classifications to relate to a history of severe suicidal and/or suicidal behaviour, whereas having a dismissing attachment style was linked to no such history (Adams et al., 1996). Adams et al. speculated whether dismissive behaviour such as minimising distress and detaching oneself from attachment-related feelings acts as a protective factor in younger participants, but increases risk in the long-term. This may be relevant to the current adult sample; whilst potentially less problematic in adolescence and young adulthood, being high in attachment avoidance may have led to greater social isolation and feelings of loneliness. If individuals high in attachment avoidance are unable to draw on interpersonal resources when they experience acute stress - either due to an absence of meaningful relationships or an unwillingness to trust others – suicide may become a viable option to escape their difficulties.

Hypothesis 2

Overall, the current results do not support the hypothesis that reflective functioning mediates the relationship between attachment security and suicidal ideation. This non-significant effect was found for both anxious and avoidant attachment. Although the relationship between attachment and reflective functioning has been well established in the literature (Fonagy & Bateman, 2016; Fonagy & Luyten, 2009; Katznelson, 2014), the relationship between reflective functioning and suicidal ideation had scarcely been examined. Previous literature had relied on proxy measures of reflective functioning (Andersson & Berggren, 2012), or examined attachment and mentalization in relation to traits of BPD (Fossati et al., 2014). Therefore, to the authors' knowledge, this was the first study to directly examine relationships between these three variables using validated measures and may indicate a true non-existent relationship. Furthermore, a multitude of important factors are theorised to mediate the relationship between insecure attachment and suicide. Other psychological constructs outlined in Adams' (1996) original model, such as affect regulation, self-esteem or personality traits, may better explain the distal relationship between attachment security and current suicidal thoughts.

Hypothesis 3

The analyses comparing participants based on their self-reported history of suicide attempts revealed several interesting findings. Foremost, recent thoughts of suicide, feelings of hopelessness and symptoms of depression were highest among multiple-attempters, as were levels of anxious attachment and hypomentalization. Furthermore, no significant differences were found between never and single-attempters, which implies there is something characteristically different about individuals who frequently attempt suicide. This pattern was most pronounced for measures of recent distress, where participants rated their feelings over the past 1-2 weeks. For trait levels of attachment and

reflective functioning, a gradual increment in levels of anxious attachment and hypomentalizing was found across the three groups. This suggests that risk of suicidal behaviour increases as individuals experience greater attachment insecurity, and more impaired mentalization.

For avoidant attachment, although no statistically significant group differences were observed, a trend emerged with the highest level of avoidant attachment found for multiple attempters. One explanation is that individuals with an anxious attachment style have made more frequent past attempts to communicate their pain and seek proximity to others. Comparatively, persons high in attachment avoidance may make less frequent but more lethal attempts, and therefore not report the same self-reported history. This corresponds with research exploring the association between adult attachment and non-suicidal self-injury, where only anxious-attachment and fears of abandonment were found to be significant predictors (Levesque, Lafontaine, Bureau, Cloutier, & Dandurand, 2010).

It should be noted that attempt history was measured using one item from the BSSI, and information was not gathered regarding the nature or lethality of these past attempts. Furthermore, self-report may have been influenced by recall bias; individual's experiencing current distress may have been more likely to disclose past attempts to express their current pain. In comparison, individuals who were less distressed and can consider their past in hindsight may view the intent behind their actions differently.

General Discussion: Implications and Limitations

Theoretical Implications

Overall, the results indicate a phenomenological distinction between individuals who have attempted suicide, and those who experience suicidal thoughts alone. This is consistent with other diathesis-stress models that view suicide as a continuum from

ideation through to attempts and death, and have suggested psychological moderators that influence transition through the spectrum (O'Connor, 2011; Van Orden et al., 2010). Here, higher attachment avoidance was found to associate with current suicidal ideation, whereas higher anxious attachment was found to differentiate individuals with a past suicide attempt, particularly those with multiple attempts.

In his theoretical paper, Adams' (1994) considered whether different characteristics of internal working models influence the severity of suicidal behaviour and the likelihood of repetition. Adams' also differentiated between predominantly interpersonal suicidal actions motivated by an urgent appeal to a threatened attachment relationship, and more despairing and potentially lethal communications driven by strong negative internal models of self and attachment figures. In relation to the current study, participants high in attachment anxiety may have engaged in more frequent suicidal actions to try and promote proximity to their romantic attachment figures. However, these actions may not have been driven by the same degree of suicidal intent felt by avoidant individuals currently experiencing more severe suicidal ideation. In support of this theory, Levi-Belz et al. (2013) found suicide attempters high in avoidant attachment to have objectively higher suicidal intent. However, to confirm whether avoidant attachment predisposes individuals to more fatal outcomes, research would need to employ prospective, longitudinal designs and follow individuals over their life span and examine the incidence of high lethality attempts and fatal suicides. As suicide is a rare outcome in the general population this would require a substantial baseline sample, and such designs are typically infeasible.

Measurement Issues

The recent development of the Reflective Functioning Questionnaire (Fonagy et al., 2016) provides researchers with a convenient method to screen individuals for deficits

in two broad types of mentalization. However, it does not claim to capture all dimensions of mentalizing or ‘real-time’ mentalizing as it unfolds in social interactions. This may have influenced findings as the capacity to mentalize has both trait and state aspects (Fonagy & Luyten, 2009). Although mentalization difficulties are a trait vulnerability related to disruptions in early attachment (Fonagy & Target, 1997), the mentalization-based model argues that impairments are amplified at times of heightened arousal triggered by current stress or interpersonal conflicts (Fonagy & Bateman, 2008; Fonagy & Luyten, 2009). In effect, the mentalizing system ‘switches off’ when the attachment system is activated. A state-trait interaction is consistent with Adams’ (1994) developmental model which places suicide as the consequence of the combination of trait vulnerabilities with current experiences that trigger the attachment system and a period of ‘attachment crisis’.

By limiting assessment to a single time-point and using general measures of attachment and mentalization, the current study was unable to detect these state fluctuations. Whilst the RFQ does attempt to capture how people think and behave when they are feeling angry, insecure or are experiencing strong emotions, if the person is not currently experiencing those difficulties their retrospective recall may not be reliable. Furthermore, the sampling procedure relied on access to participants who could provide informed consent and tolerate spending time with an unknown researcher completing self-report measures. It is unlikely that nursing staff would have allowed access to participants experiencing current levels of high expressed emotion, and that these individuals could have provided informed consent under those circumstances.

The absence of a mediation effect may also be due to the choice of outcome variable. A moderate relationship was found between increased hypomentalization and high attachment-anxiety, yet only attachment avoidance related to increased suicidal

ideation. However, group comparisons revealed that a history of multiple suicide attempts was associated with both anxious-attachment and hypomentalizing; therefore, it would be interesting to explore whether hypomentalizing tendencies explain any relationship between anxious-attachment and future suicidal behaviour. In contrast, the relationship between avoidant attachment and suicide-related outcomes may be mediated by other psychological constructs. For example, greater loneliness and reduced self-disclosure have been shown to mediate the relationship between attachment avoidance and lethality of suicide attempts (Levi-Belz et al., 2013).

Attachment was measured using the ECR-R; a self-report measure of two relatively orthogonal adult attachment dimensions (Fraley et al., 2000). This questionnaire has been widely used in psychological research to capture attachment anxiety and avoidance (Ravitz, Maunder, Hunter, Sthankiya, & Lancee, 2010). However, whilst these dimensions represent insecure attachment orientations, they are both organised patterns of relating that enable adults to select strategies that are most adaptive within their relationships (Paetzold, Rholes, & Kohn, 2015). Disorganised attachment is a distinct element of the adult attachment system where the central characteristic is a general fear of romantic attachment figures (Main & Hesse, 1990). Research has shown that whilst correlated, disorganised attachment is different from both attachment anxiety and avoidance and persons who are disorganised tend to use conflicting approach and avoidance strategies in their interactions with romantic partners (Paetzold et al., 2015). Previous research that has found unresolved-disorganised to be the predominant attachment pattern in suicidal participants (Adams et al., 1996); indicating that this may be an important attachment element that is overlooked in the majority of self-report research. Paetzold et al. (2015) have recently developed and validated a dimensional measure for

assessing disorganisation in adults that could be administered alongside traditional measures in research that is unable to use extensive interview methods.

Limitations and Future Research

There are further limitations that need to be acknowledged when interpreting the findings. Foremost, like most literature in this field the current study employed an observational, cross-sectional design that relied on self-report data. Therefore, casual inferences cannot be made about any of the results, and those pertaining to past behaviour (i.e. suicide attempts) may be subject to recall bias.

Furthermore, measuring trait differences in attachment and mentalization conflicts with the theoretical argument that fluctuations under acute stress are key for predicting suicidal behaviour. This raises an important question of how researchers can ethically capture state-level psychological constructs that are activated in times of acute distress. To advance this field, research could consider adopting more intensive, micro-longitudinal designs, such as Ecological Momentary Assessment (EMA; Shiffman, Stone, & Hufford, 2008), that support real-time assessment at multiple time points. However, even more ecologically valid methodologies would rely on continued compliance from participants during states of high emotional arousal. Experimental studies could be a potential avenue to confirm some of the theorised mechanisms. For example, whether higher-order cognitive functions such as mentalizing are compromised during times of acute stress and whether the extent of inhibited mentalization would vary based on participants' history of suicidal behaviour and/or degree of attachment insecurity. However, it is debatable whether traditional acute laboratory stressors (e.g. Trier Social Stress Test; Kirschbaum, Pirke, & Hellhammer, 1993) could accurately mimic the kind of interpersonal experiences known to trigger crises in attachment.

The Adult Attachment Interview remains the gold standard attachment assessment instrument, and it has the added advantage of being able to capture disorganised attachment which is overlooked in many self-report measures (Ravitz et al., 2010). However, its application is often unfeasible due to the resources and training required to administer the interview. The Experiences in Close Relationships Questionnaire is a sound alternative that is widely used within psychological research and has excellent psychometric properties (Fraley et al., 2000; Ravitz et al., 2010). Furthermore, it captures dimensions of attachment that can detect more subtle differences than traditional classification methods. In the future, it would be advantageous to combine the ECR-R with a dimensional measure of disorganised attachment to capture both organised and disorganised insecure attachment orientations.

As already alluded to, the current study focused on recent suicidal ideation and did not gather more detailed information on participants' history of suicidal thoughts, communications and attempts over their lifespan. Furthermore, the current findings cannot be generalised to completed suicide.

Finally, the current sample size was modest and therefore the study may have been underpowered to detect true findings. The number of variables included in the analyses was restricted due to the small sample size, and more advanced statistical methods that rely on larger sample sizes (i.e. structured equational modelling) were not employed. However, the fact that some significant effects were found despite the small sample is promising, and these may be amplified in future research that is more adequately-powered.

Conclusions

The current research aimed to provide insight into the relationships between attachment, mentalizing impairments and suicidality. The present results do not support

mentalization, as measured by the RFQ, as a mediator in the relationship between insecure attachment dimensions and suicidal ideation. Further research is required to confirm whether state-variations in mentalization during periods of attachment crisis could underpin suicidal thoughts and actions. Until this has been achieved, it is difficult to comment on the potential clinical utility of mentalization-based therapies in relation to reducing risk.

However, the current findings provide further evidence of an association between avoidant attachment and suicidal ideation, and highlight ways in which insecure attachment patterns may infer different degrees of suicidal risk. Attachment-based interventions that seek to alter key characteristics of attachment avoidance, such as fear of intimacy and reduced self-disclosure (Mikulincer & Shaver, 2007a), and promote appropriate support seeking in times of distress, may help reduce suicidal ideation and subsequent suicide attempts.

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Appendix A: BRaT Author Guidelines



BEHAVIOUR RESEARCH AND THERAPY

AUTHOR INFORMATION PACK

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To foster transparency, we encourage you to state the availability of your data in your submission. This may be a requirement of your funding body or institution. If your data is unavailable to access or unsuitable to post, you will have the opportunity to indicate why during the submission process, for example by stating that the research data is confidential. The statement will appear with your published article on ScienceDirect. For more information, visit the [Data Statement page](#).

AFTER ACCEPTANCE

Online proof correction

Corresponding authors will receive an e-mail with a link to our online proofing system, allowing annotation and correction of proofs online. The environment is similar to MS Word: in addition to editing text, you can also comment on figures/tables and answer questions from the Copy Editor. Web-based proofing provides a faster and less error-prone process by allowing you to directly type your corrections, eliminating the potential introduction of errors.

If preferred, you can still choose to annotate and upload your edits on the PDF version. All instructions for proofing will be given in the e-mail we send to authors, including alternative methods to the online version and PDF.

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Appendix B: NHS Research Ethics Committee Approval Letter



Telephone: 0207 104 8021

26 April 2017

Miss Holly Turton
Trainee Clinical Psychologist
University of Manchester
2nd Floor Zochonis Building
Brunswick Street
Manchester
M13 9PL

Dear Miss Turton

Study title: Exploring the role of emotion regulation and reflective functioning in the relationship between attachment security and suicidality.

REC reference: 17/NW/0194

Protocol number: 1

IRAS project ID: 220309

Thank you for your submission. I can confirm the REC has received the documents listed below and that these comply with the approval conditions detailed in our letter dated 20 April 2017

Documents received

The documents received were as follows:

Document	Version	Date
Participant consent form	3	24 April 2017

Approved documents

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

Document	Version	Date
Copies of advertisement materials for research participants [Study Poster General]	1	06 January 2017
Copies of advertisement materials for research participants [Study Poster GMMHT]	1	07 January 2017
Copies of advertisement materials for research participants [Study Poster Pennine Trust]	1	07 January 2017
Evidence of Sponsor insurance or indemnity (non NHS Sponsors only) [Insurance Letter]		14 February 2017
GP/consultant information sheets or letters [GP Letter informing of patient participation]	1	04 January 2017
Interview schedules or topic guides for participants [Questionnaire Pack Full]	2	25 February 2017
IRAS Application Form [IRAS_Form_08032017]		08 March 2017

IRAS Application Form XML file [IRAS_Form_08032017]		08 March 2017
IRAS Checklist XML [Checklist_08032017]		08 March 2017
Letter from sponsor [Sponsor Letter]		14 February 2017
Non-validated questionnaire [Demographic Information Sheet]	v2	25 February 2017
Other [Research Subcommittee Letter Jessica Green]		21 November 2016
Other [Research Subcommittee Approval Holly Turton (email)]		21 November 2016
Other [Consent to Contact Form]	1	26 February 2017
Other [Personal Information Form]	1	25 February 2017
Participant consent form	3	24 April 2017
Participant information sheet (PIS) [Participant Information Sheet]	2	25 February 2017
Research protocol or project proposal [CLOSE Project Protocol]	1	04 January 2017
Summary CV for Chief Investigator (CI) [Holly Turton (CI) CV]	1	06 January 2017
Summary CV for student [Jessica Green (student) CV]	1	04 January 2017
Summary CV for supervisor (student research) [Daniel Pratt CV]	1	04 January 2017
Summary CV for supervisor (student research) [Adam Danquah CV]	1	04 January 2017
Summary CV for supervisor (student research) [Katherine Berry CV]	1	04 January 2017
Summary, synopsis or diagram (flowchart) of protocol in non technical language [Distress Protocol]	1	07 January 2017
Summary, synopsis or diagram (flowchart) of protocol in non technical language [Risk Protocol]	2	26 February 2017
Validated questionnaire [Brief Betrayal Trauma Survey]		
Validated questionnaire [Beck Hopelessness Scale Information]		
Validated questionnaire [Beck Scale of Suicidal Ideation (BSS) Information]		
Validated questionnaire [Difficulties in Emotion Regulation Survey (DERS)]		
Validated questionnaire [Experiences in Close Relationships Questionnaire - Revised (ECR-R)]		
Validated questionnaire [Patient Health Questionnaire - 9 (PHQ-9)]		
Validated questionnaire [Reflective Functioning Questionnaire (RFQ)]		

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.

17/NW/0194	Please quote this number on all correspondence
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Yours sincerely



Anna Bannister
REC Manager

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

Copy to: *Ms. Lynne Macrae*
Miss Rachel Rosenhead, Greater Manchester Mental Health NHS Foundation Trust

Appendix C: HRA Approval Letter



Miss Holly Turton
Trainee Clinical Psychologist
University of Manchester
2nd Floor Zochonis Building
Brunswick Street
Manchester
M13 9PL

Email: hra.approval@nhs.net

28 April 2017

Dear Miss Turton

Letter of HRA Approval

Study title:	Exploring the role of emotion regulation and reflective functioning in the relationship between attachment security and suicidality.
IRAS project ID:	220309
REC reference:	17/NW/0194
Sponsor	University of Manchester

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 www.hra.nhs.uk/hra-approval.

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](http://www.hra.nhs.uk), 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](http://www.hra.nhs.uk).

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 at <http://www.hra.nhs.uk/resources/applying-for-reviews/nhs-hsc-rd-review/>.

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

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

IRAS project ID	220309
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procedure. If you wish to make your views known please use the feedback form available on the HRA website: <http://www.hra.nhs.uk/about-the-hra/governance/quality-assurance/>.

HRA Training

We are pleased to welcome researchers and research management staff at our training days – see details at <http://www.hra.nhs.uk/hra-training/>

Your IRAS project ID is **220309**. Please quote this on all correspondence.

Yours sincerely

Michael Higgs

Assessor

Email: hra.approval@nhs.net

*Copy to: Miss Jessica Green, University of Manchester [Student]
Ms Lynne Macrae, University of Manchester [Sponsor]
Miss Rachel Rosenhead, Greater Manchester Mental Health NHS Foundation Trust [Lead NHS R&D]*

Appendix D: Questionnaire Pack



QUESTIONNAIRE PACK **The CLOSE (Closeness to Others and Suicidal Experiences) Study**

Chief Investigators: Jessica Green and Holly Turton

Thank you for agreeing to participate in this research study. On the next pages you will find a number of questionnaires. Please read each set of directions carefully and answer the questions accordingly.

We would like to remind you that all your responses are confidential and no identifiable information will be held with your responses, ensuring your anonymity.

If you have any questions or concerns, speak to the researcher who will do their best to assist you.

Demographic Information

1. Participant Code: (to be completed by researcher)	
2. Age:	
3. Gender <div style="display: flex; justify-content: space-between;"> <div> <input type="checkbox"/> Male <input type="checkbox"/> Female </div> <div> <input type="checkbox"/> Other: <input type="checkbox"/> Prefer not to say </div> </div>	
4. Ethnic background: <div style="display: flex; justify-content: space-between;"> <div style="width: 48%;"> <p>White</p> <input type="checkbox"/> English/Welsh/Scottish/Northern Irish/British <input type="checkbox"/> Irish <input type="checkbox"/> Gypsy or Irish Traveller <input type="checkbox"/> Other: </div> <div style="width: 48%;"> <p>Mixed / multiple ethnic groups</p> <input type="checkbox"/> White and Black Caribbean <input type="checkbox"/> White and Black African <input type="checkbox"/> White and Asian <input type="checkbox"/> Other: </div> </div> <div style="display: flex; justify-content: space-between; margin-top: 10px;"> <div style="width: 48%;"> <p>Asian/ Asian British</p> <input type="checkbox"/> Indian <input type="checkbox"/> Pakistani <input type="checkbox"/> Bangladeshi <input type="checkbox"/> Chinese <input type="checkbox"/> Other: </div> <div style="width: 48%;"> <p>Black / African / Caribbean / Black British</p> <input type="checkbox"/> African <input type="checkbox"/> Caribbean <input type="checkbox"/> Other: </div> </div> <div style="display: flex; justify-content: space-between; margin-top: 10px;"> <div style="width: 48%;"> <input type="checkbox"/> Any Other Ethnic Group: </div> <div style="width: 48%;"> <input type="checkbox"/> Prefer not to say </div> </div>	
5. Highest level of education received (e.g. University Degree, A-levels, GCSEs, O-levels, Secondary School)	
6. Current relationship status (e.g. single, in a relationship but not co-habiting, co-habiting, married, separated/divorced, widowed)	
7. Current employment status? (e.g. student, full-time employment, part-time employment, unable to work due to disability, unemployed, retired)	

8. Have you ever been diagnosed with a mental health problem?

☐ Yes

☐ No

If yes, please provide details:

If you consider yourself to have any other mental health problems, please provide details below:

9. Do you consider yourself to have a disability?

☐ Yes

☐ No

☐ Prefer not to say

If yes, please provide details:

Patient Health Questionnaire – 9 (PHQ-9)

Over the last 2 weeks , how often have you been bothered by the following problems?	Not at all	Several days	More than half the days	Nearly every day
1. Little interest or pleasure in doing things	0	1	2	3
2. Feeling down, depressed, or hopeless	0	1	2	3
3. Trouble falling or staying asleep, or sleeping too much	0	1	2	3
4. Feeling tired or having little energy	0	1	2	3
5. Poor appetite or overeating	0	1	2	3
6. Feeling bad about yourself – or that you are a failure or have let yourself or your family down	0	1	2	3
7. Trouble concentrating on things, such as reading the newspaper or watching television	0	1	2	3
8. Moving or speaking so slowly that other people could have noticed? Or the opposite – being so fidgeting or restless that you have been moving around a lot more than usual	0	1	2	3
9. Thoughts that you would be better off dead or of hurting yourself in some way	0	1	2	3

If you checked off any problems, how difficult have these problems made it for you to do your work, take care of things at home, or get along with other people?

Not difficult at all	Somewhat difficult	Very difficult	Extremely difficult
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Kroenke, K., Spitzer, R.L., & Williams, J.B. (2001). The PHQ-9: validity of a brief depression severity measure. Journal of General Internal Medicine, 16(9), 606-613.

|

****Insert Beck Hopelessness Scale here (BHS)****

Information can be found at:

<http://www.pearsonclinical.com/psychology/products/100000105/beck-hopelessness-scale-bhs.html>

****Insert Beck Scale for Suicidal Ideation here (BSS)****

Information can be found at:

<http://www.pearsonclinical.com/psychology/products/100000157/beck-scale-for-suicide-ideation-bss.html>

The following question will be administered following the Beck Scale for Suicidal Ideation.

Approximately, when was the last time you had any thoughts of killing yourself?

- | | |
|--|--|
| <input type="checkbox"/> Today | <input type="checkbox"/> In the past 3 months |
| <input type="checkbox"/> In the past week | <input type="checkbox"/> In the past 6 months |
| <input type="checkbox"/> In the past fortnight | <input type="checkbox"/> In the past year |
| <input type="checkbox"/> In the past month | <input type="checkbox"/> More than 1 year ago |
| | <input type="checkbox"/> Never |

Personal Experiences

<p>For each item below, please mark one response in the columns labelled 'Before Age 18' AND one response in the columns labelled 'Age 18 or Older'.</p> <p>Have each of the following events happened to you, and if so, how often?</p>	Before Age 18			Age 18 or Older		
	Never	1 or 2 times	More than that	Never	1 or 2 times	More than that
1. Been in a major earthquake, fire, flood, hurricane, or tornado that resulted in significant loss of personal property, serious injury to yourself or a significant other, the death of a significant other, or the fear of your own death.						
2. Been in a major automobile, boat, motorcycle, plane, train, or industrial accident that resulted in similar consequences.						
3. Witnessed someone with whom you were very close (such as a parent, brother or sister, caretaker, or intimate partner) committing suicide, being killed, or being injured by another person so severely as to result in marks, bruises, burns, blood, or broken bones. This might include a close friend in combat.						
4. Witnessed someone with whom you were not so close undergoing a similar kind of traumatic event.						
5. Witnessed someone with whom you were very close deliberately attack another family member so severely as to result in marks, bruises, blood, broken bones, or broken teeth.						
6. You were deliberately attacked that severely by someone with whom you were very close.						
7. You were deliberately attacked that severely by someone with whom you were not close.						
8. You were made to have some form of sexual contact, such as touching or penetration, by someone with whom you were very close (such as a parent or lover).						
9. You were made to have such sexual contact by someone with whom you were not close						
10. You were emotionally or psychologically mistreated over a significant period of time by someone with whom you were very close (such as a parent or lover).						
11. Experienced the death of one of your own children.						
12. Experienced a seriously traumatic event not already covered in any of these questions.						

Goldberg, L.R. & Freyd, J.J. (2006). Self-reports of potentially traumatic experiences in an adult community sample: Gender differences and test-retest stabilities of the items in a Brief Betrayal-Trauma Survey. *Journal of Trauma & Dissociation*, 7(3), 39-63.

Experiences in Close Relationships – Revised (ECR-R) Questionnaire

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

	Strongly Disagree							Strongly Agree
1. I'm afraid that I will lose my partner's love.	1	2	3	4	5	6	7	
2. I often worry that my partner will not want to stay with me.	1	2	3	4	5	6	7	
3. I often worry that my partner doesn't really love me.	1	2	3	4	5	6	7	
4. I worry that romantic partners won't care about me as much as I care about them.	1	2	3	4	5	6	7	
5. I often wish that my partner's feelings for me were as strong as my feelings for him or her.	1	2	3	4	5	6	7	
6. I worry a lot about my relationships.	1	2	3	4	5	6	7	
7. When my partner is out of sight, I worry that he or she might become interested in someone else.	1	2	3	4	5	6	7	
8. When I show my feelings for romantic partners, I'm afraid they will not feel the same about me.	1	2	3	4	5	6	7	
9. I rarely worry about my partner leaving me.	1	2	3	4	5	6	7	
10. My romantic partner makes me doubt myself.	1	2	3	4	5	6	7	
11. I do not often worry about being abandoned.	1	2	3	4	5	6	7	
12. I find that my partner(s) don't want to get as close as I would like.	1	2	3	4	5	6	7	
13. Sometimes romantic partners change their feelings about me for no apparent reason.	1	2	3	4	5	6	7	
14. My desire to be very close sometimes scares people away.	1	2	3	4	5	6	7	
15. I'm afraid that once a romantic partner gets to know me, he or she won't like who I really am.	1	2	3	4	5	6	7	
16. It makes me mad that I don't get the affection and support I need from my partner.	1	2	3	4	5	6	7	

	Strongly Disagree				Strongly Agree		
17. I worry that I won't measure up to other people.	1	2	3	4	5	6	7
18. My partner only seems to notice me when I'm angry.	1	2	3	4	5	6	7
19. I prefer not to show a partner how I feel deep down.	1	2	3	4	5	6	7
20. I feel comfortable sharing my private thoughts and feelings	1	2	3	4	5	6	7
21. I find it difficult to allow myself to depend on romantic partners.	1	2	3	4	5	6	7
22. I am very comfortable being close to romantic partners.	1	2	3	4	5	6	7
23. I don't feel comfortable opening up to romantic partners.	1	2	3	4	5	6	7
24. I prefer not to be too close to romantic partners.	1	2	3	4	5	6	7
25. I get uncomfortable when a romantic partner wants to be very close.	1	2	3	4	5	6	7
26. I find it relatively easy to get close to my partner.	1	2	3	4	5	6	7
27. It's not difficult for me to get close to my partner.	1	2	3	4	5	6	7
28. I usually discuss my problems and concerns with my partner.	1	2	3	4	5	6	7
29. It helps to turn to my romantic partner in times of need.	1	2	3	4	5	6	7
30. I tell my partner just about everything.	1	2	3	4	5	6	7
31. I talk things over with my partner.	1	2	3	4	5	6	7
32. I am nervous when partners get too close to me.	1	2	3	4	5	6	7
33. I feel comfortable depending on romantic partners.	1	2	3	4	5	6	7
34. I find it easy to depend on romantic partners.	1	2	3	4	5	6	7
35. It's easy for me to be affectionate with my partner.	1	2	3	4	5	6	7
36. My partner really understands me and my needs.	1	2	3	4	5	6	7

Fraley, R. C., Waller, N. G., & Brennan, K. A. (2000). An item-response theory analysis of self-report measures of adult attachment. Journal of Personality and Social Psychology, 78, 350-365.

Reflective Functioning Questionnaire (RFQ)

Please work through the next 8 statements. For each statement, choose a number between 1 and 7 to say how much you disagree or agree with the statement. Do not think too much about it – your initial responses are usually the best.

	Strongly disagree	1	2	3	4	5	6	7	Strongly agree
1. People's thoughts are a mystery to me		1	2	3	4	5	6	7	
2. I don't always know why I do what I do		1	2	3	4	5	6	7	
3. When I get angry I say things without really knowing why I am saying them		1	2	3	4	5	6	7	
4. When I get angry I say things that I later regret		1	2	3	4	5	6	7	
5. If I feel insecure I can behave in ways that put others' backs up		1	2	3	4	5	6	7	
6. Sometimes I do things without really knowing why		1	2	3	4	5	6	7	
7. I always know what I feel		1	2	3	4	5	6	7	
8. Strong feelings often cloud my thinking		1	2	3	4	5	6	7	

Fonagy P, Luyten P, Moulton-Perkins A, Lee YW, Warren F, Howard S, et al. *Development and validation of a self-report measure of mentalizing: The Reflective Functioning Questionnaire. PLOS ONE. 2016; 11(7):e0158678.*

Difficulties in Emotion Regulation Scale (DERS)

Please indicate how often the following statements apply to you by writing the appropriate number from the scale below in the box beside each item.

1-----	2-----	3-----	4-----	5-----
almost never (0-10%)	sometimes (11-35%)	about half the time (36-65%)	most of the time (66-90%)	almost always (91-100%)

1. I am clear about my feelings	
2. I pay attention to how I feel	
3. I experience my emotions as overwhelming and out of control	
4. I have no idea how I am feeling	
5. I have difficulty making sense out of my feelings	
6. I am attentive to my feelings	
7. I know exactly how I am feeling	
8. I care about what I am feeling	
9. I am confused about how I feel	
10. When I'm upset, I acknowledge my emotions	
11. When I'm upset, I become angry with myself for feeling that way	
12. When I'm upset, I become embarrassed for feeling that way	
13. When I'm upset, I have difficulty getting work done	
14. When I'm upset, I become out of control	
15. When I'm upset, I believe that I will remain that way for a long time	
16. When I'm upset, I believe that I will end up feeling very depressed	
17. When I'm upset, I believe that my feelings are valid and important	
18. When I'm upset, I have difficulty focusing on other things	

1 -----	2 -----	3 -----	4 -----	5
almost never (0-10%)	sometimes (11-35%)	about half the time (36-65%)	most of the time (66-90%)	almost always (91-100%)

19. When I'm upset, I feel out of control	
20. When I'm upset, I can still get things done	
21. When I'm upset, I feel ashamed at myself for feeling that way	
22. When I'm upset, I know that I can find a way to eventually feel better	
23. When I'm upset, I feel that I am weak	
24. When I'm upset, I feel like I can remain in control of my behaviours	
25. When I'm upset, I feel guilty for feeling that way	
26. When I'm upset, I have difficulty concentrating	
27. When I'm upset, I have difficulty controlling my behaviours	
28. When I'm upset, I believe there is nothing I can do to make myself feel better	
29. When I'm upset, I become irritated at myself for feeling that way	
30. When I'm upset, I start to feel very bad about myself	
31. When I'm upset, I believe that wallowing in it is all I can do	
32. When I'm upset, I lose control over my behaviour	
33. When I'm upset, I have difficulty thinking about anything else	
34. When I'm upset, I take time to figure out what I'm really feeling	
35. When I'm upset, it takes me a long time to feel better	
36. When I'm upset, my emotions feel overwhelming	

Gratz, K. L. & Roemer, L. (2004). Multidimensional assessment of emotion regulation and dysregulation: Development, factor structure, and initial validation of the Difficulties in Emotion Regulation Scale. *Journal of Psychopathology and Behavioral Assessment*, 26, 41-54.

Paper Three: Reflecting on the Research Process

Word Count: 5994 (excluding references)

Overview

The following paper is a critical reflection of the research carried out within the current thesis. The main findings of the systematic review and empirical study are discussed in paper one and two. Additionally, I commented on key limitations, clinical implications and suggestions for future research. Therefore, the purpose of the following paper is to provide insight and reflections on the research process which was beyond the scope of papers one and two. I will provide explanations and justifications of key decisions made during the research process, and critically reflect on factors relating to study design, methodology, recruitment, data analysis and personal experience.

Systematic Literature Review

Topic selection

Discussions around a suitable question for the systematic review began early in the research process. A thorough review of Reflective Functioning had recently been published (Katznelson, 2014) and only a few studies had examined mentalization, or other conceptually-related constructs (e.g. Theory of Mind), in relation to suicide-related outcomes. However, I could not find a systematic review exploring attachment and suicide, despite a sizeable number of papers being published. Therefore, I began scoping and compiling search terms for *‘the relationship between attachment style and suicidality: a systematic review’*.

During this time an article was published that reviewed the literature between adult attachment and suicidality (Miniati, Callari, & Pini, 2017), and I discovered that a similar review was being undertaken by a PhD student. Therefore, to contribute something unique to the field I began to scope for alternative research questions. A large population-based study into suicide and adult attachment concluded that *‘future research should be directed at clarifying the mechanisms of these relationships and investigating the utility of*

integrating attachment-based assessment and interventions into psychiatric care'

(Palitsky, Mota, Afifi, Downs, & Sareen, 2013, p. 584). Following this recommendation, I scoped the literature on attachment-based interventions for suicide-related outcomes (e.g. Attachment-based Family Therapy; Diamond et al., 2010). I was interested from a clinical perspective whether psychological interventions that target attachment insecurity and the quality of family relations could reduce suicidal thoughts and behaviours. However, there were not enough papers to justify a systematic review and it was difficult to define what interventions should be classified as 'attachment-based'. However, several recent articles had explored mediating variables in the attachment-suicide relationship. Given the aims of my empirical paper I thought it would be worthwhile to synthesise this literature.

Therefore, I narrowed my focus to those studies that had explored the role of psychological and social variables in the relationship between attachment styles and suicide-related thoughts and behaviours.

Overall, I am glad I went through this process. I feel the current systematic review is more informative for clinical psychologists as it identifies key psychological mechanisms that could be targeted by psychosocial interventions. Yet, at the time starting over was disheartening as I had made good progress with my initial review and was set back by several months. This increased my workload towards the end of the research process and meant I had to compromise in other areas to complete my review by the thesis deadline.

Identifying Eligible Papers

From scoping the literature, I was aware that the number of eligible papers was likely to be less than 20. Therefore, I wanted comprehensive, inclusive search terms to reduce the likelihood of missing key papers and avoid being left with too few papers to warrant a review. I was also aware that electronic databases vary in their indexing of

MeSH terms or Subject Headings, and so searched each database individually using terms and headings tailored to the database.

In retrospect, some of the search terms were too broad, resulting in over 4,000 abstracts that needed to be screened. For example, the inclusion of terms such as object-relat* or parent-relat* resulted in records discussing psychodynamic theory or general family relationships that were not specific to attachment. The inclusion of broad search terms increased my confidence that key papers had not been missed. However, if I was to run the search again I would consider restricting my search to terms more closely linked to the target variables, e.g. attach* and suicide*.

I was cautious not to apply too many limits when searching electronic databases as this automatically excluded relevant journal articles that had been incorrectly labelled. However, only applying a language limit meant a lot of time was spent screening out records such as book chapters, dissertation abstracts and editorials. On reflection, I could have taken the further step of limiting papers based on date of publication. A decision was made to automatically exclude articles published before 1980 as the first publication of validated attachment measures was not until the late 80s (Hazan & Shaver, 1987), however this limit could have been applied at the database search stage.

When screening titles and abstracts, it was difficult to judge whether a study had included a validated measure of attachment, or carried out mediation or moderation analyses. Therefore, I was overly inclusive and retained any article that appeared to measure constructs conceptually-related to attachment (e.g. parental bonding, family functioning) and suicide. To reduce heterogeneity, a decision was made when screening full texts to only include papers that directly assessed attachment. The main debate was whether to include studies that only administered the Parental Bonding Instrument (PBI; Parker, Tupling, & B. Brown, 1979), which captures recollections of parental behaviours

and attitudes in childhood. A review of attachment measures included the PBI as a measure of adult attachment (Ravitz, Maunder, Hunter, Sthankiya, & Lancee, 2010). However, Manassis, Owens, Adam, West, and Sheldon-Keller (1999) examined whether the PBI is comparable to the Adult Attachment Interview (AAI; C. George, Kaplan, & Main, 1996), and advised caution using the PBI in clinical samples where suboptimal attachment histories are likely. As a research team, we decided that whilst the PBI is a useful measure of perceived parenting style, other interpersonal experiences can influence attachment and its inclusion would increase further diversity into an already heterogeneous sample of studies. Therefore, the PBI and other measures of perceived parenting or family functioning were not considered acceptable measures of attachment style.

As discussed in paper one, there are limitations to restricting the inclusion criteria to English-language studies published in peer-reviewed journals. Including ‘grey literature’ would have ensured that the most up-to-date research was included in the review. Furthermore, it may have moderated publication bias; the fact studies with significant results are more likely to be published, and therefore conclusions based only on published data can be misleading (Easterbrook, Gopalan, Berlin, & Matthews, 1991). The strict inclusion criteria may have limited the comprehensiveness of the review and increased the risk of bias towards westernised studies with significant findings. However, excluding grey literature maintains a degree of quality assurance associated with the peer-review process. Also, there was limited time and resources to systematically identify grey literature and translate non-English language articles.

Quality assessment

Finding a quality assessment tool appropriate for the current review was a difficult task. Several potential options were suggested by my research team, including the EPHPP

Quality Assessment Tool for Quantitative Studies (Effective Public Health Practice Project, 1998) and the 'Checklist for Measuring Quality' (Downs & Black, 1998). However, both focus on intervention studies and if we were to hold the current set of observational studies to the same standard it would have produced floor effects. The Newcastle-Ottawa Scale (NOS; Wells et al., n.d.) was also considered and appeared the most promising as separate scales are available for cohort and case-control studies. However, this does not include cross-sectional studies which make up most the current review. Furthermore, critique of the NOS scale has highlighted that some of its items are invalid and it can produce highly arbitrary results (Stang, 2010). Based on this, I decided a Quality Assessment Tool for Observational Cohort and Cross-sectional studies, developed by methodologists from the National Institute of Health and Research Triangle Institute (National Institute for Health, n.d.), felt most appropriate for the collection of studies under review.

The tool was designed to help reviewers focus on areas of bias that are key for critical appraisal of a study, rather than to provide a numeric score. To provide an indication to the reader of how studies compared, I calculated the percentage of relevant items that were satisfied by each study. However, as expected, the scores were generally equivalent as the studies adopted similar designs. Therefore, I primarily used the tool to identify the key areas of bias within the available literature and from this made recommendations for future research.

If I were to quality appraise a similar set of studies in the future, I would consider adapting a tool to make it more appropriate and specific to the research topic. For example, it would have been useful to tailor general items about measure validity and reliability, to differentiate between instruments considered more reliable and valid in the

literature. However, due to time constrictions resulting from delays earlier in the review process this was not feasible for the current review.

Study Heterogeneity

Due to the limited number of studies examining the target variables, no restrictions were imposed regarding age of participants, nature of the population or psychiatric diagnosis. Furthermore, included studies used a range of attachment and suicide assessment tools, and there was minimal uniformity regarding what intervening variables were investigated in the relationship between attachment and suicide-related outcomes. Overall, this resulted in a set of studies that were incredibly heterogeneous. As well as making meta-analyses infeasible, this diversity meant it was difficult to synthesise study findings into a coherent narrative.

Upon re-reading Adams (1994) developmental model of suicide I was struck by the fact many of the psychosocial mediator/moderators, investigated in the papers under review, could be mapped onto components of the original model. Therefore, this provided a natural framework for organising findings and highlighted the value of Adams' model alongside other contemporary, more well-evidenced explanations such as the Integrated motivational-volitional model (O'Connor, 2011), the Arrested Flight Model (Williams, 2001) and the Interpersonal-Psychological Model of Suicide (Joiner, 2005).

Future Directions

Based on the findings of the systematic review, several suggestions for future research were recommended in paper one. This included the need for longitudinal research to establish causal, temporal relationships, greater consideration of disorganised attachment styles and the use of structured equation modelling to provide evidence for hypothesised developmental pathways. Using Adams' (1994) model to organise the published literature was also useful for highlighting psychological mechanisms that have

not yet been evidenced. For example, many studies focused on vulnerability factors such as interpersonal difficulties, low self-control and maladaptive schemas. Whilst the reverse of these could be considered resilience factors, few studies examined the role of protective factors. Health professionals are unable to alter what has passed. However, having an increased knowledge of protective factors that may buffer against the consequences of adverse attachment experiences could highlight qualities that should be fostered through psychological intervention to protect against future risk. Furthermore, the role of other constructs closely associated with early attachment disruptions, such as affect regulation, have yet to be examined. Emotional regulation has been evidenced as a mediator in the relationship between adult anxious-attachment and anxiety symptomology (Nielsen et al., 2017), and attachment and depressive symptomology (Malik, Wells, & Wittkowski, 2015). Therefore, it would be of interest to examine the potential mediational role of emotional dysregulation in the association between attachment and suicide-related outcomes.

A further limitation was the lack of consistency regarding suicide terminology and the use of general terms which can encompass a range of suicide-related thoughts and behaviours. Silverman, Berman, Sanddal, O'Carroll, and Joiner (2007) have outlined a clear nomenclature for suicide-related terminology, and greater adherence to this within the literature would increase clarity of what constructs have been investigated.

Paper 2: Empirical Paper

Study Development and Design

Upon embarking on a quantitative project, an initial concern was the feasibility of recruiting enough clinical participants alongside the competing demands of the doctoral training programme. Therefore, I combined my project with another trainee's (HT) to maximise recruitment. We each chose a mediating variable we wanted to explore and

administered a joint battery of questionnaires to participants. For the doctoral thesis, analyses were carried out independently and HT's target variable (emotion regulation) was not included in the present analyses. However, mentalization and affect regulation complement each other well and are theoretically intertwined in regards to attachment and subsequent psychopathology (Fonagy & Bateman, 2008; Fonagy, Gergely, Jurist, & Target, 2002). Therefore, a long-term goal is to examine both variables using path analysis such as Structured Equational Modelling. To support this, during the research process we supported two master students to carry out the same study in a non-clinical sample. Therefore, a larger data set is available for future research that may be sufficiently powered to introduce more variables into the analysis.

Choosing a Mediator

I requested the current project based on my previous experience conducting research in the field of psychological models of suicide, and an interest to learn more about Attachment Theory. However, I needed to select a theoretically-driven mediator to explore in relation to the attachment-suicide relationship. Due to my previous experience, I was drawn to variables outlined in the Integrated Motivational-Volitional (IMV) Model of Suicidal Behaviour (O'Connor, 2011), such as social problem-solving, thwarted belongingness and burdensomeness. However, my supervisory team encouraged me to view the current project as a distinct exploration of suicide-related behaviour in the context of attachment, and to explore psychological constructs more closely linked to disruptions in early attachment. I began by reading Adams (1994) seminal chapter on his Developmental Model of Attachment and Suicidal behaviour, but initially found the concepts incomprehensible due to my stage of training and basic knowledge of attachment theory. Therefore, I focused my early reading on similar research papers in the field which

had explored psychological mediators in the attachment-suicide relationship (e.g. Levi-Belz, Gvion, Horesh, & Apter, 2013; Stepp et al., 2008).

At this stage I was unfamiliar with the concept of reflective functioning and was unsure of how mentalization impairments could increase vulnerability to suicide-related behaviour. However, I was excited by the fact that the Reflective Functioning Questionnaire (Fonagy et al., 2016) had just been made available for public use and the current research could improve upon previous studies that relied on proxy measures of reflective functioning (Andersson & Berggren, 2012; Duno et al., 2009).

At times, I regretted my decision to examine reflective functioning using a self-report questionnaire, which was exacerbated by the absence of any significant mediation effects. However, as my understanding of mentalization developed and I became more familiar with the work of Peter Fonagy and colleagues (Fonagy & Bateman, 2016; Fonagy et al., 2002; Fonagy & Luyten, 2009) my perspective shifted. As critiqued in paper two, the cross-sectional design employed in the current study did not lend itself well to the study of mentalization which is deactivated under conditions of high stress and arousal. However, I am grateful that I was introduced to mentalization by my research supervisors as it is an important psychological capacity that warrants further exploration with more robust and appropriate methodology. Learning about mentalization has also impacted my clinical practice within an acute adolescent inpatient environment. My new understanding of how mentalization has influenced how I formulate and intervene with young persons diagnosed with ‘emerging personality disorder’ who present with recurrent self-injurious behaviour.

Measurement Considerations

Another important consideration when designing the project was what would be reasonable and appropriate given our target population of high-risk individuals with recent

suicidal ideation. We aimed to design an assessment that could feasibly be carried out within a single, one-hour session to limit attrition and participant burden. Furthermore, the number of variables included in the analysis was restricted by how many participants could feasibly be recruited in a 6-9-month period within the current NHS climate. Therefore, we limited measurement to the main variables of interest and key confounders of suicide; current depression and feelings of hopelessness (Minkoff, Bergman, Beck, & Beck, 1973; Weishaar & Beck, 1992). Given the close association between childhood maltreatment and insecure attachment (Widom, Czaja, Kozakowski, & Chauhan, 2018), we also administered a measure of betrayal trauma. However, this was not included in the current analyses as we needed to limit the number of predictor variables due to the small sample size.

Regarding the assessment of suicide-related outcomes, initially I wanted to use a more semi-structured format such as the Self-injurious Thoughts and Behaviours Interview (Nock, Holmberg, Photos, & Michel, 2007) or the Columbia-suicide Severity Rating Scale (Posner et al., 2011). However, it was felt these measures would produce a wealth of information that would not be included in the analyses (e.g. details regarding non-suicidal self-injury) and that a dimensional measure would be more appropriate for measuring inter-individual variation. A systematic review of suicide ideation measures concluded that the Beck Scale for Suicidal Ideation (Beck, Kovacs, & Weissman, 1979) is best suited for population-based research due to comprehensive psychometric data which supports its use (Batterham et al., 2015). Therefore, this scale was adopted as our main outcome measure. However, prominent suicide models highlight key differences between suicide ideation and suicide-related behaviour (Joiner, 2005; O'Connor, 2011), and therefore we cannot generalise the current findings to attempts or fatal behaviour. Furthermore, exploratory analyses within the empirical study indicated different risk

factors for suicidal ideation vs. self-report attempt history (i.e. avoidant attachment vs. anxious attachment respectively). Further research using more valid and reliable measurement of suicide-related behaviour is required to confirm these individual differences.

Measuring Attachment

There are many approaches to measuring and classifying adult attachment that have been referenced throughout paper one and paper two. Generally, all instruments differentiate between patterns of secure attachment and subtypes of insecure attachment, using one of three broad methods. Interview methods such as the Adult Attachment Interview (AAI; C. George et al., 1996), projective tests such as the Adult Attachment Projective (AAP; Carol George & West, 2001) both of which do not rely on conscious self-evaluation, and self-report questionnaires that assess conscious attitudes towards relationships and experiences of separation, loss, intimacy, dependence and trust (Mikulincer & Shaver, 2007).

Early supervisory discussions focused on what adult-attachment measure would be the most appropriate for the current project. Given the nature of the population we intended to recruit, I wanted to use a measure that had good psychometric validity but was also easy-to-administer and would minimise burden. The AAI (C. George et al., 1996) is the most established instrument and has excellent psychometric properties (Bakermans-Kranenburg & van IJzendoorn, 1993). However, it requires significant resources and is extremely time-consuming to administer, transcribe and code (Ravitz et al., 2010). Furthermore, researchers need to be trained to administer the interview which was not possible with the limited trainee research budget. Therefore, it was accepted that a self-report instrument would be most feasible and appropriate for the current project.

Self-report measures can be divided into those that categorise participants, and those that assess participants on dimensions of attachment. In clinical settings, these categorisations can be incredibly useful for facilitating understanding of individual difference and formulating psychological difficulties. However, within research settings dimensions of attachment can detect more subtle differences between individuals (Ravitz et al., 2010). Therefore, a decision was made to adopt a dimensional measure of attachment. The Revised Experiences in Close Relationships scales (ECR-R; R.C. Fraley, Waller, & Brennan, 2000) have excellent internal consistency reliability and have been widely used to study to relationships between attachment and psychopathology (Mikulincer & Shaver, 2007; Ravitz et al., 2010). I voiced initial concerns about the wording of the ECR-R items as they appear to be written for people in romantic relationships. However, instructions ask people to consider how they act generally in relationships and it was agreed this would be emphasised to participants who were not currently in a relationship.

Most participants completed the ECR-R with no reported concerns, regardless of their current relationship status. However, participants who had never had a romantic relationship or had not been in a romantic relationship for many years reported that they answered hypothetically. Such responses may not accurately reflect their attachment experiences and could therefore be less reliable. For example, one participant reflected that their responses would have been different if they considered their parental relationship. Longitudinal research has evidenced that parental attachment predicts romantic attachment styles in adulthood (Pascuzzo, Cyr, & Moss, 2013; Roisman, Collins, Sroufe, & Egeland, 2005). However, this anecdotal evidence supports contemporary theories such as the Dynamic-Maturational Model of Attachment and Adaption (DMM; Crittenden, 2008) which emphasis that attachment matures across the life-span and

strategies adopted in adulthood are context-dependent. Adopting a more complex conceptualisation of attachment was beyond the scope of the current research, and would have required administration of the AAI. However, authors of the ECR-R have also developed the ECR- Relationship Structures Questionnaire (R. C. Fraley, Heffernan, Vicary, & Brumbaugh, 2011); which can be used for a variety of relational targets and used as a state-like measure when needed. This may have been a more appropriate measure as it would have enabled assessment of attachment patterns across a variety of close relationships and highlighted intra-individual differences.

Disorganised Attachment

An advantage of the AAI is that, unlike most self-report instruments, participants can be classified as ‘unresolved’ which is intended to conceptually correspond to the disorganised attachment category observed in infants (Main & Hesse, 1990). A limitation of the empirical study, which was also found generally in the systematic review, is that disorganised attachment is often overlooked or fearful attachment is used a proxy for this distinct attachment style. Participants with histories of abuse or suicidality often have unresolved/disorganised attachment styles (Bakermans-Kranenburg & van IJzendoorn, 2009), therefore more convenient methods are required to measure disorganised attachment. Since the study development period I have discovered a 9-item Adult Disorganised Attachment scale (ADA; Paetzold, Rholes, & Kohn, 2015) that could be utilised in future research to assess disorganisation in adulthood and its consequences. Since this is a relatively brief measure it could be administered alongside more traditional measures to ensure both organised and disorganised attachment styles are assessed.

Recruitment Process and Reflections

As outlined above, the recruitment process was shared with another trainee (HT). Our recruitment target was eighty participants in accordance with the general rule of a

minimum of 10 participants per predictor variable for regression equations using six or more predictors (Wilson VanVoorhis & Morgan, 2007). Although we missed our target by 13 participants, joining our projects meant we could recruit enough participants to allow meaningful statistical analyses. This also reduced service burden by only having one project attempting to recruit participants with similar experiences. We decided to focus our efforts on separate NHS trusts within the North West, which enabled us to make recruitment contacts in more services without this becoming overwhelming for either trainee.

If this had not been a joint recruitment effort, I could not have recruited enough participants alongside the competing demands of doctoral training. However, there were other benefits to sharing the research process with another trainee. The subject matter under investigation is highly emotive and at times the individuals we met with were currently experiencing high levels of suicidal ideation and psychological distress. Furthermore, we had to adhere to general practice guidelines and our risk management protocol in regards to safeguarding issues and disclosing risk. As a rule, we had a verbal debrief following every participant, which also allowed us to seek guidance from each other that we had managed any disclosures of risk appropriately. Although we had supervision from our supervisory team when required, this additional peer supervision and support was invaluable.

There were several challenges to recruitment which may partly explain why we did not meet our target of 80 participants. One of the NHS trusts we planned to recruit from merged with another trust as we were gaining ethical approval. In the long-term this was beneficial as it meant we were then able to recruit from the new, larger NHS trust that covered more services. However, this was a significant period of service upheaval and reorganisation that undoubtedly impacted on our ability to engage services. Several

primary and secondary care teams did not respond to our efforts to reach out to them, and those that did requested we wait until service organisation issues had been resolved which was not feasible with the limited time frame.

Our final sample was largely made up of participants recruited from inpatient mental health services, once we made contacts with psychologists, research-nurses and occupational therapists (OTs) that granted us regular access to the wards. Being present on a regular basis meant we could liaise with the nursing team, who then identified and approached eligible individuals on our behalf. Furthermore, many of the local inpatient services had a research lead who could promote the project, and OTs invited us to present at community meetings on the wards. These structures were not in place in community mental health teams, who also had the added pressure of having to refer their clients to Clinical Research Network portfolio studies. Diverting our efforts away from community services enabled us to complete recruitment within the planned time frame.

Despite this, we continued to encounter some barriers recruiting through inpatient services. Nurses often reported they did not have any patient on the ward who were currently suicidal, and we had to re-emphasise that the criterion was suicidal thoughts in the past 12 months. Furthermore, as we accessed acute wards there was often a rapid admission-discharge rate which meant nursing staff were not always familiar with all patients on the ward or their difficulties. A further challenge was that some staff members were reluctant to approach participants they believed would not engage, particularly those with a Personality Disorder diagnosis. However, several participants with a Personality Disorder diagnosis engaged well with the study and reported that they wanted to participate to help other people like them. Promoting the project during ward-based community meetings largely overcame these barriers, as patients could self-refer if they were interested and felt they met the inclusion criteria. We then confirmed with the

nursing team that this was accurate and appropriate. This also empowered patients to self-refer to the project if they wanted to contribute.

Data Analysis

Inclusion of Variables

The final number of participants recruited over a six-month period was sixty-seven, with sixty-five being included in the final analysis. As this fell short of our initial target, we excluded betrayal trauma from current analyses to reduce the number of independent variables. Furthermore, we also measured hopelessness as a potential covariate, as it has been consistently demonstrated to be a strong predictor for suicide-related outcomes (McMillan, Gilbody, Beresford, & Neilly, 2007; Weishaar & Beck, 1992). This was evidenced in the current study; the strong relationship between hopelessness and suicidal ideation was larger than any other correlation coefficient. However, due to the high degree of shared variance between these constructs, indeed many studies use hopelessness as a proxy for suicide (e.g. McKeown, Clarbourn, Heron, & Thomson, 2016), it was felt that hopelessness was more akin to a dependent variable. By controlling for hopelessness as a covariate, it would leave minimal variance to be explained by other variables. Therefore, hopelessness was not controlled for in the mediation analysis.

Mediation Analysis

When approaching data analysis, I was unsure whether mediation was appropriate given the cross-sectional design of the study. This was confirmed upon meeting with a statistician who felt you should not conduct mediation analysis with cross-sectional data. However, my supervisory team introduced me to a more pragmatic perspective outlined in Hayes and Rockwood (2017), who contend that traditional criteria are just ideals rather than literal requirements. Hayes argues that most research within natural sciences would

not come to fruition if researchers adhered to these strict requirements of causal inference, and they would rather see imperfect work conducted and published than no research at all. I found this more relaxed position reassuring as it places the responsibility upon the researcher to make logical and reasonable inferences about their data. I recognise that due to the design of the current study I cannot make claims regarding cause-effect relationships. However, I do think it was justified to carry out exploratory mediational analyses. This has laid the groundwork for future research that has the resources to engage in experimental manipulation or collect data overtime.

After conducting preliminary partial correlations, although a relationship was observed between avoidant attachment and suicidal ideation (path *c*), I questioned whether further mediation analyses were necessary given the absence of significant coefficients between avoidant attachment and hypomentalizing (path *a*), and hypomentalizing and suicidal ideation (path *b*). However, this rationale was based on the Baron and Kenny (1986) ‘casual steps’ approach, which requires both *a* and *b* coefficients to be statistically significant for mediation to be possible (see fig. 1).

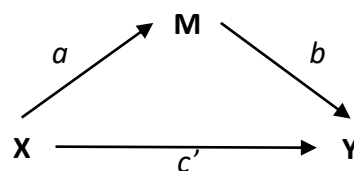


Fig. 1. Simple Mediation Model

However, these requirements increase the risk of type II error, where coefficients may be non-significant because of a lack of power. This is a likely possibility in the current study; small effects were found for paths *a* and *b* which may have reached significance if the sample size had been larger. By contemporary thinking, tests of

significance for the individuals paths a and b are not required to determine where M mediates the effect of X on Y . Instead, all that matters is whether the indirect effect (ab) is different from zero, which can be inferred from bootstrapped confidence intervals (Hayes & Rockwood, 2017). Therefore, mediation analyses were carried out to examine the presence of an indirect effect of attachment on suicidal ideation via hypomentalizing tendencies.

Methodological Limitations

The methodological limitations of the empirical study were reviewed in depth in paper two. However, one limitation that warrants further consideration is sampling bias. Participants could either self-refer into the current study or were identified by members of their care team as being eligible. Self-referral increases the likelihood of self-selection bias, where those who chose to volunteer differ in important ways from the general population being studied (i.e. recent suicide ideators). Many self-referral participants were currently functioning well and wanted to contribute in the hope they could help others. These individuals are unlikely to represent the population, particularly those who are ashamed about their suicidal tendencies and are reluctant to speak openly. This was reflected in the gender distribution in the current sample; twice as many females volunteered despite the male suicide rate being 3 times higher (Office of National Statistics, 2017). Men are thought to be at higher risk of suicide due to societal expectations of how they should behave; they are conditioned to not talk about their feelings and to respond to stress by taking risks, such as misusing alcohol and drugs (Wyllie et al., 2012). These traits of ‘toxic masculinity’ may discourage men from volunteering for research studies, and overlap with traits characteristic of an avoidant attachment style; minimise distress and avoid emotional intimacy. The current results may have differed substantially if the sample population was more representative of individuals

known to be at greater risk for suicide. Going forward, a key challenge is how to access these hard to reach individuals and engage them in research.

Personal Reflections

Although I requested a quantitative project due to a personal preference for statistics, I realised that I held implicit judgements that quantitative research was less meaningful than qualitative methods. I caught myself undermining the project when describing it to others (i.e. ‘it’s *only* a questionnaire study’) and feeling frustrated that the study design was not more sophisticated. This may have been a result of previously being a research assistant on a large grant-funded project, which made the current smaller-scale project seem less esteemed in comparison.

However, meeting with participants altered these preconceptions. Many reported they found completing the questionnaires helpful as it gave them an opportunity to reflect on their current mental state and previous experiences. Others stated they found the questionnaire format refreshing, as they had never been asked so directly about their suicidal thoughts. One participant even asked where she could access them to complete them regularly in her own time, to monitor her progress going forward as she embarked on a DBT programme. These experiences made me realise that research does not have to consist of in-depth interviews to be a meaningful experience for the participant, and I will be more encouraged to carry out quantitative research going forward.

Despite this, some of my prejudgments were confirmed. Data collection involved meeting face-to-face with thirty-four individuals, who had all recently experienced thoughts to end their life and were willing to speak about this to a stranger. I also met with other service users via community meetings and hearing-voices groups. When the sum of these experiences was reduced to a single SPSS database, it felt anti-climactic and it did

not adequately reflect the richness of this experience. Through meeting with participants, I gained far more insight into their current circumstances than could be captured with the questionnaire measures. This has increased my motivation to conduct more exploratory qualitative research in the future as a qualified Clinical Psychologist. For example, I would be interested in investigating the barriers to recruiting male participants to suicide-related research and possible ways to overcome them.

I was particularly mindful of boundaries during recruitment, particularly when I felt pulled to listen to participants' stories as they were giving up their time with no financial incentive. Having another trainee to consider this with was beneficial, as it encouraged me to reflect on process issues and the boundary between offering a debrief and falling into a therapeutic role which was inappropriate. Particularly within inpatient environments, I was struck by how much participants appreciated the 1:1 time despite the interaction not being explicitly therapeutic. This emphasised how under-resourced current inpatient services are, and that most individuals just want to be heard and to feel like they have made a valid contribution. My role as an independent researcher may have enabled participants to feel more at ease to have open conversations about suicide, whereas they may have felt unable to share this with nursing staff due to concerns this would impact their care.

The Importance of Suicide Prevention Research

When explaining death by suicide, there is a tendency to focus on mental health and view suicide as a symptom of a psychiatric disorder. Whilst this is undoubtedly important as psychological illness, particularly depression, is an underlying factor in most suicides, many people with mental health problems do not take their own life. Considering suicide purely as a symptom of a psychiatric illness is overly reductive and disregards the

contribution of psychological, social and gender inequalities that exist both within the UK, and worldwide.

Through carrying out this research I hoped to contribute to the evidence base that has highlighted the key role of developmental factors in suicide risk, which begin in early childhood when our internal models of ourselves, others and the world begin to develop. This is not to place blame on caregivers, but rather to increase understanding that reducing suicide rates relies on early prevention initiatives so children have the best start in life. This could encourage the development of psychological resilience and necessary interpersonal skills to buffer against psychological distress and suicide-related behaviour in adulthood.

In addition to my clinical and research work, I have personally experienced how suicide-related behaviour can impact both the individual and their wider support system. I have heard suicide being discussed pejoratively; particularly the use of stigmatising language (i.e. suicide as selfish, attention-seeking) due to a lack of understanding of what drives somebody to consider taking their own life. I have also witnessed the suppression of conversations about suicide-related behaviour when it has occurred within my family, which encourages the view that suicide is a shameful act that should not be spoken about. By conducting research that aims to improve our understanding of suicide, I hope to contribute to the demystification and de-stigmatisation of suicide and work towards reducing suicide rates through effective psychological and social interventions.

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