Childhood Trauma, Attachment and Suicide Risk: A Daily Diary Investigation

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The candidate confirms that the work submitted is her own and that appropriate credit has been given where reference has been made to the work of others.

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Abstract

Background: Suicide is a leading cause of death globally and a serious public health concern. Childhood trauma is a background risk factor for experiencing suicidal ideation, or making suicide attempts, in adulthood. Little is known about the role of attachment in the childhood trauma-suicide relationship, particularly as a moderating variable. The current study investigated for the first time whether attachment moderates the childhood trauma-suicidality relationship, at the daily level, in the general population.

Method: Four hundred and eighty-one participants completed questionnaires assessing experiences of childhood trauma, attachment patterns, and history of suicidality. Two hundred and forty-three participants continued to a second, daily diary phase where measures of daily stress, defeat and entrapment were completed for seven consecutive days.

Results: The data was analysed using correlations, regressions, and hierarchical linear modelling. Childhood trauma and attachment were found to be associated with a history of suicide ideation and attempts, as well as greater daily stress, defeat and entrapment. Attachment moderated the relationship between childhood trauma and a history of suicide ideation. In addition, childhood trauma and attachment both moderated the daily stress-entrapment slope. However, the nature of the interactions was unclear, and requires further investigation.

Discussion: Findings from the study highlight the importance of considering attachment patterns in suicide risk assessments and interventions, as well as in the leading suicide models. With less secure attachments (i.e., more anxious or avoidant) associated with historical suicidality as well as risk factors for suicide at the daily level, clinicians would benefit from recognising the impact of attachment patterns. Further research is needed to determine the possible moderating or mediating role of attachment in the childhood trauma-suicide relationship and would benefit from lifespan studies to establish causality, as well as temporality.

Table of Contents

List of Tables

List of Figures

List of Abbreviations

Abbreviation	Meaning
AAI	Adult Attachment Interview
ACEs	Adverse Childhood Experiences
APMS	Adult Psychiatric Morbidity Survey
APA	American Psychological Association
BSSI	Beck Scale for Suicide Ideation
CI	Confidence Interval
CTQ	Childhood Trauma Questionnaire
DDP	Dyadic Developmental Psychotherapy
ECR-RS	The Experiences in Close Relationships-Relationship Structures
ECR-R	Experiences in Close Relationships-Revised
EMA	Ecological Momentary Assessment
GP	General Practitioner
HLM	Hierarchical Linear Modelling
IMV	The Integrated Motivational-Volitional Model of Suicide
IPTS	The Interpersonal-Psychological Theory of Suicidal Behaviour
MLM	Multilevel Linear Modelling
NHS	National Health Service
NSSI	Non-Suicidal Self-Injury
OR	Odds Ratio
PSS-Brief	Perceived Stress Scale-Brief
PTSD	Post-Traumatic Stress Disorder
QR	Quick Response
SD	Standard Deviation
SDES	Short Defeat and Entrapment Scale
SE	Standard Error
WHO	World Health Organisation

1.0 Introduction

Overview

With suicide being one of the leading causes of deaths worldwide, this research seeks to expand on the well-established association between childhood trauma and suicide by considering the role of attachment. It aims to advance traditional cross-sectional studies by adopting a novel daily diary approach to assess *background* (underlying vulnerability) risk factors for suicide, alongside daily fluctuations in *proximal* (immediate vulnerability) risk factors. With attachment featuring minimally in the current suicide models, this research hopes to better understand the significance of individual patterns of attachment, as both a risk and protective factor, to aid the assessment of suicide risk.

It is hypothesised that people with less secure (i.e., more anxious and avoidant) attachment patterns, as well as those who have experienced trauma in childhood, are more likely to have experienced either thoughts of suicide or to have attempted suicide, in the past. In addition, it is expected that these individuals will experience proximal risk factors for suicide to a greater extent, on a daily basis. Moreover, it is hypothesised that the relationship between childhood trauma and both a history of suicidality, as well as experiencing risk factors for suicide daily, will be stronger in individuals with less secure attachment patterns.

This first chapter aims to outline key psychological models of suicide. The role of childhood trauma and attachment as background risk factors for suicidality, and the relationship between these, will then be explored, along with key proximal risk factors. Following this, research investigating attachment as a moderating or mediating variable in the childhood trauma-suicide relationship will be reviewed to help inform the current research direction. Finally, a summary of methodological issues with current suicide research will be presented, with a focus on how the present study will address such matters. The aims and hypotheses of the study will be highlighted both throughout the chapter, and in summary at the end.

1.1 Terminology

Much variation exists in the terminology used to describe suicidal thoughts and behaviours. This thesis takes the lead from both current suicide research, along with language preferences from people who have been directly affected by suicide (Padmanathan et al., 2019). Therefore, 'ideation' is used to describe the experience of having thoughts to end one's life, but not acting on these. Suicidal thoughts and suicidal ideation are used interchangeably throughout and have the same meaning.

'Suicide attempt' will be used to refer to when an individual actively tries to die by suicide. With 'commit suicide' having criminal connotations, the term 'died by suicide' is considered acceptable by individuals affected by suicide (Padmanathan et al., 2019) and will be used to refer to when a suicide attempt results in death. The term 'suicidality' will be used as a collective term for suicidal ideation and/or attempts to die by suicide.

Although a contentious issue, non-suicidal self-injury (NSSI) is considered the deliberate harm of one's body in the absence of suicidal intent (Nock, 2010). Therefore, with the current research interested in suicidal thoughts and behaviours, research looking at NSSI will not be focussed on in this thesis.

1.2 Suicide Research Overview

Suicide has a devastating impact on individuals, families and communities, and is a serious global public health issue (WHO, 2021). A cross-national study, interviewing over 85,000 adults, estimated that the lifetime prevalence of suicidal ideation and suicide attempt is 9.2% and 2.7%, respectively (Nock et al., 2008). Importantly, Nock et al (2008) also demonstrated that the probability of an individual with suicidal thoughts proceeding to make a suicide attempt is nearly 30%. With an estimated 800,000 people dying by suicide each year, globally, the World Health Organisation (WHO) has prioritised reducing the number of people who die by suicide by one third by 2030 (World Health Organization, 2019).

The most recent national confidential inquiry into suicide in 2021 found, using data between 2008-2018, that just 27% of people that died by suicide in the general population were in contact with mental health services in the year prior (Healthcare Quality Improvement Partnership, 2021),

suggesting that around three quarters of people who die by suicide have not recently been in contact with, or accessing support from, mental health services. It is therefore crucial that more research is undertaken with this population, as opposed to those recruited through mental and physical health settings. With an estimated 80% of people who die by suicide having been in contact with a primary health care service, such as their General Practitioner (GP), in the year prior to ending their life (Stene-Larsen & Reneflot, 2019), and 45% in the month prior (Ahmedani et al., 2014), this suggests that there are opportunities to assess for suicidality in individuals who may be at risk.

A wealth of research has been carried out to attempt to understand, predict, and prevent suicidal thoughts and attempts in the population. Despite such efforts, a meta-analysis including 365 studies that were focussed on investigating risk factors for suicidality concluded that we are no better at predicting risk factors at present than 50 years ago (Franklin et al., 2016). Understanding not just the variables which appear to increase the risk, but how factors interact and impact one another to enhance the likelihood of suicide is paramount in helping to prevent it; essentially, a shift from identifying risk *factors,* to risk *algorithms* (Franklin et al., 2016). By expanding and developing what is known about the possible pathways to suicide, a more sensitive and precise prediction of who may be more likely to experience suicidality can be anticipated. Investigation of these pathways is imperative to both physical and mental health professionals, who may be required to assess their patients' level of suicide risk, but also to non-professionals who may be concerned for loved ones (Franklin et al., 2016).

1.3 Psychological Models of Suicide

Many theoretical models have been developed to help make sense of the causes of, or factors leading to, suicide; from those with a psychodynamic origin, positing that internal forces stimulate self-destruction (Freud, 1920), to those with a diathesis-stress orientation, proposing that pre-dispositional vulnerabilities interact with subsequent stressors, resulting in suicidal thoughts and behaviours. Whilst each theory offers its own unique pathway to suicide, based on a set of proven risk factors, none are able to completely explain why suicide happens (Franklin et al., 2016), suggesting that a complex interplay between a range of variables, unique to each individual, may best explain how suicidality arises. Despite this, there remains merit in continuing to develop and refine suicide theory and models of suicide, to highlight those at risk and prevent harm. A summary of key psychological models of suicide will now be presented.

1.3.1 Arrested Flight Model (Cry of Pain)

The 'Cry of Pain' hypothesis (Williams, 1997) built on Baumeister's (1990) influential research which argued that the primary motivation of suicide was to escape psychological pain, as opposed to demonstrating a 'cry for help'. By incorporating evolutionary theory, Williams (1997) integrated what is known about animal behaviour when escape is not possible, known as 'arrested flight' in birds (Gilbert and Allan, 1988), to suggest that suicide results from wanting to escape feelings of entrapment. The model theorises that entrapment, associated with being in a defeating or humiliating situation, is experienced as a sense of there being no alternative way out of the mental pain and, therefore, suicide is viewed as the only escape. This model has been supported by research demonstrating the significance of feelings of defeat and entrapment in suicidal individuals (O'Connor, 2003).

1.3.2 Interpersonal Theory of Suicide (ITPS)

The later interpersonal theory of suicide (Joiner, 2005) was the first model to begin differentiating between those who think about suicide, and those who act on such thoughts and engage in suicidal behaviours (Barzilay & Apter, 2014). The IPTS describes how the presence of two constructs, perceived burdensomeness (feeling a burden to others) and thwarted belongingness (feeling that you do not belong), lead to suicidal thoughts. When individuals also have what Joiner termed as an 'acquired capability for suicide', such as a fearlessness to pain, this may then trigger a serious suicide attempt. An acquired capability may be particularly relevant for people with a history of self-harmful behaviour, where regularly self-inflicting harm has increased their tolerance for pain (Stanley et al., 2001).

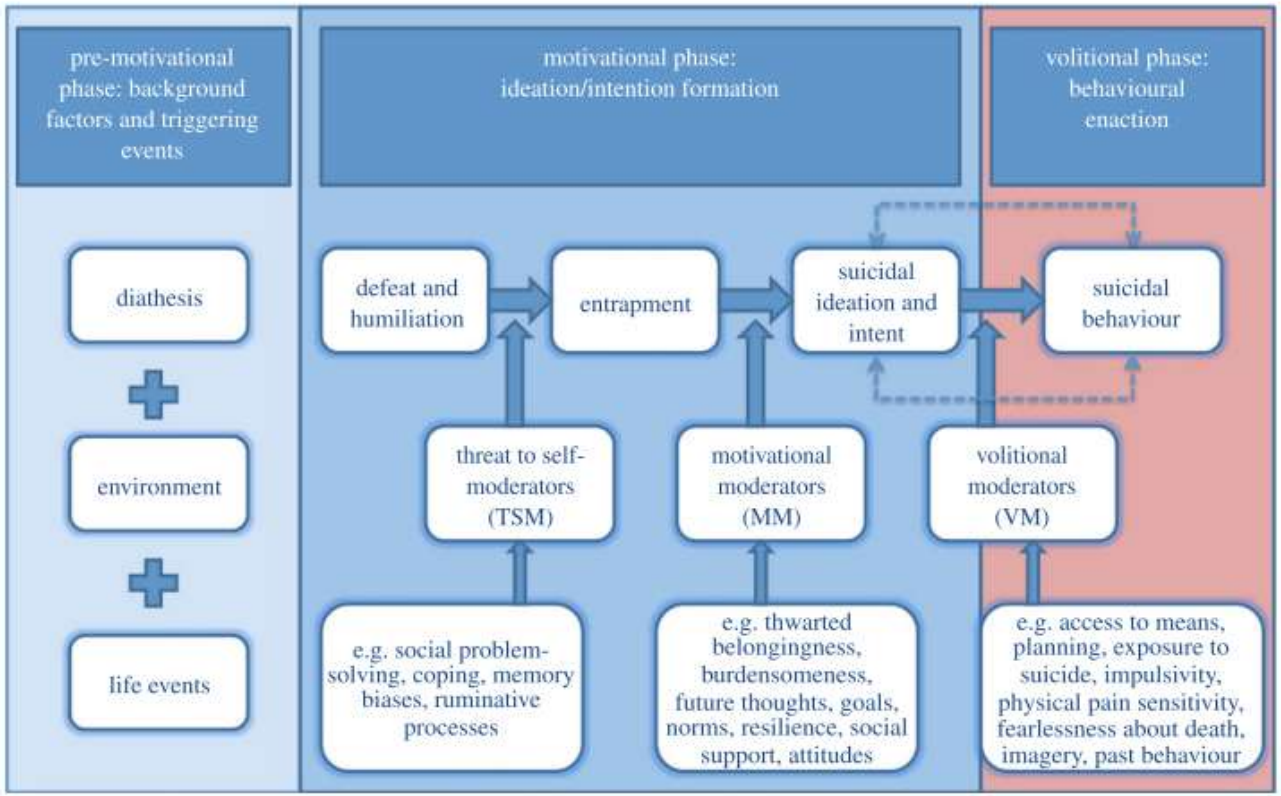
1.3.3 Integrated Motivational-Volitional (IMV) of Suicidal Behaviour

Drawing from the aforementioned models, as well as the theory of planned behaviour (Ajzen, 1991) and differential activation hypothesis (Teasdale & Dent, 1987), the Integrated Motivational-Volitional (IMV) is a tripartite model of suicidal behaviour first published by O'Connor (2011), and further developed by O'Connor and Kirtley (2018). It is an ideation-to-action model, providing a theoretical framework to understand the genetic, biological, social and cultural influences involved in suicidal ideation and behaviours (O'Connor, 2021). It looks to combine the key components of previous theories to present an overarching, holistic framework for suicide. Most notably, the model

aims to distinguish between factors which cause suicidal thoughts, and factors which see thoughts of suicide being enacted, that is, attempts to die by suicide. The IMV model, depicted in Figure 1, proposes three distinct biopsychosocial phases by which suicidality may develop. Each of these phases will be briefly summarised.

Figure 1.

The IMV model of suicidal behaviour



Note: The Integrated Motivational–Volitional model of Suicidal Behaviour (O'Connor, 2011; O'Connor & Kirtley, 2018). Reprinted from 'The integrated motivational-volitional model of suicidal behaviour' O'Connor & Kirtley (2018). *Philosophical Transactions of the Royal Society B: Biological Sciences, 373* (1-10).

Firstly, a pre-motivational phase offers the context for which suicidal thinking and behaviours may emerge. This stage is comprised of a triad: diathesis (underlying vulnerabilities), the environment, and negative life events (O'Connor et al., 2020). These distal vulnerability factors can include personality and cognitive differences, as well as a biological predisposition. The environment and negative life events are closely linked and can come in many forms, for example negative experiences such as racism (Rudes & Fantuzzi, 2022), and low socioeconomic status (Näher et al., 2020). Adverse childhood experiences, attachment patterns and stress (O'Connor, 2021) are assumed to be located within the pre-motivational stage and will be discussed in depth later in the chapter.

Following this, a motivational phase offers a framework to explain how these core, background vulnerabilities from the pre-motivational phase develop into suicidal thoughts. This second phase differs slightly from Joiner's (2005) model and suggests, similar to the Cry of Pain model (Pollock & Williams, 2001; Williams, 2001), that feelings of defeat, humiliation, and entrapment are key drivers to the development of suicidal ideation, all of which may be triggered by a stressful life event (O'Connor et al., 2020). Crucially, the IMV states that it is the experience of humiliation and defeat, that cannot be escaped from (i.e., entrapment), which drive suicidal ideation (O'Connor, 2021). Defeat and entrapment have shown to be predictive of suicidal ideation in a range of populations including university students (Dhingra et al., 2015; Tucker et al., 2016), as well as individuals hospitalised following a suicide attempt (O'Connor et al., 2013), providing empirical support for this phase.

Finally, a volitional phase, not dissimilar to Joiner's (2005) 'acquired capability for suicide', sees the transition from suicide ideation to someone attempting, or dying by, suicide. The model poses a number of specific volitional factors, such as exposure to others who have engaged in suicidal behaviours or access to the means to die by suicide (O'Connor & Kirtley, 2018), that bridge the gap between thinking about suicide, and acting on these thoughts. The IMV model also recognises that the pathway to suicide is best understood as a cyclical process, as opposed to a linear pathway, whereby individuals may switch back and forth between having thoughts of suicide and attempting to die by suicide (O'Connor & Kirtley, 2018). The aforementioned study by Dhingra et al (2015) also provides evidence for this final phase of the model; students who had attempted suicide differed from students who had experienced thoughts of suicide on a number of volitional factors such as impulsivity, and being close to someone who had attempted suicide. These findings have been replicated in large samples of adults participants (Branley-Bell et al., 2019; Wetherall et al.,

2018) and are supportive of the notion that the factors leading to suicidal thoughts are distinct from those that lead to suicidal behaviour.

Despite the growing evidence in support of the IMV, some studies have failed to support the central tenets, for example, entrapment did not significantly predict suicidal ideation in a prisoner population (Gooding et al., 2017), and research involving college students did not find that defeat impacted suicidal ideation indirectly, through entrapment (Tucker et al., 2016). However, since defeat is hypothesised to precede feelings of entrapment, the cross-sectional nature of the latter study may have prevented this relationship from being observed. Although some research has investigated the model in diverse populations (Atilola & Ayinde, 2015; Hollingsworth, 2017; Hye-Ji & Sung-Woo, 2017), support has primarily been provided by Western samples, reducing the generalisability of the model. However, a key strength of the IMV model is that it generates specific hypotheses that can be tested (O'Connor, 2021), with research seeking to understand the roles of temporality and complex interactions within the model having being identified as a priority (O'Connor & Kirtley, 2018). Due to the extent of the empirical research in support of the model, and its prominence in the suicide literature, the IMV model was used to help inform the direction of the current study, and findings will be discussed in the context of this model.

1.4 Childhood Trauma as a Background Factor for Suicide Risk

According to the IMV model, childhood trauma is considered to sit within the pre-motivational phase of suicide, as a background risk factor. Adults who have developed the necessary skills to manage difficult experiences, and subsequently experience trauma, can usually find a way to recover. However, children do not yet possess such coping skills and so are in a far more vulnerable position. They are at risk of negative long-term effects (Gerhardt, 2004), including suicide (Felitti et al., 1988), after traumatic experiences.

Childhood 'trauma', childhood 'maltreatment' and 'Adverse Childhood Experiences' (ACEs), are terms used throughout the literature to refer to early life adversity, specifically experienced during the childhood years. Variations in terminology are reflective of expanding research into the negative impact of early life experiences (NHS Highland, 2018). For example, there are now understood to be childhood experiences that *directly* impact the child, typically categorised into physical, sexual and emotional abuse, as well as physical and emotional neglect. In contrast, there are experiences that may *indirectly* impact the child, through their environment, such as poverty, parental separation and domestic violence (NHS Highland, 2018).

Present across both developed and developing nations (Akmatov, 2011), unfortunately childhood trauma is not uncommon; in England, trauma and abuse resulted in nearly 54,000 children being looked after by local authorities in 2021 (UK Government, 2021). In terms of adult survivors of childhood trauma, this translates to approximately one in five adults alive today having experienced abuse before the age of 16 (Office for National Statistics, 2020). This figure is likely an underestimate still, given many survivors of childhood abuse never disclose their experiences, resulting in cases remaining absent from data reporting (Office for National Statistics, 2019a).

A seminal study by Felitti et al (1988) investigated the long-term effects of a range of ACEs experienced by American children growing up. The study highlighted how factors such as being abused, or having a caregiver who engaged in substance misuse, were associated with poorer outcomes later in life, including depression, physical health problems, and suicide behaviours (Felitti et al., 1988). Using a large sample of over 8,000 adults, Felitti et al (1988) showed that the prevalence of suicide attempts was 18% in those who had experienced four or more ACEs. Startlingly, this risk increased by 30-fold in adults who had experienced 7 or more ACEs (Dube et al., 2001), suggesting a strong and cumulative effect of adverse childhood experiences.

Following this pivotal study, the research base has expanded in support of the relationship between childhood trauma and suicidality. Childhood abuse and neglect have been linked to suicidality in a wide range of populations, including adults, college students and clinical populations (Bahk et al., 2017; Tae & Chae, 2021; Wang et al., 2022). Across both clinical and community adult samples, Angelakis et al (2019) identified a two- to three-fold increase in the likelihood of suicidality when adults were identified as having experienced physical, emotional or sexual abuse during childhood; importantly, this association was found independently of differences in demographics and psychiatric diagnoses. A meta-analysis including participants recruited from a number of different settings highlighted that, specifically, emotional abuse had the strongest effect on suicide behaviour (Liu et al., 2017). However, physical and sexual abuse, neglect, and witnessing domestic violence in childhood were most highly associated with lifetime risk of suicide attempt in a meta-analysis specifically looking at longitudinal studies in adolescents and adults (Zatti et al., 2017). The reason for such heterogeneity between studies is likely due to differences in measures adopted, study designs, and populations sampled.

In line with the current literature, evidencing a strong relationship between childhood trauma and suicide risk in adulthood, a broad hypothesis of the current study is therefore as follows:

- **Higher levels of childhood trauma will be associated with a history of suicidality (ideation and attempts).**

Importantly, suicidality is certainly not always an outcome of having experienced trauma during childhood (Afifi & MacMillan, 2011), however estimates show that nearly 80% of people who attempt suicide have experienced at least one type of childhood trauma (O'Connor et al., 2018). In order to better understand pathways to suicide, risk factors in suicide research should be combined. This will allow for more complex relationships between factors increasing suicide vulnerability to be understood (Franklin et al., 2016). In order to further disentangle the association between childhood trauma and suicide risk, research has begun exploring the role of mediating and moderating factors in this pathway, such as depression, anxiety, perceived social support, and stress (Bahk et al., 2017; O'Connor et al., 2018; Stagaki et al., 2022). Recent research has suggested that the role of attachment in the childhood trauma-suicidality relationship should be explored (Stagaki et al., 2022; Zortea et al., 2020), given it is closely linked to childhood trauma (Erozkan, 2016; Fuchshuber et al., 2019).

The early years of childhood provide experiences which act as the basis for later development, in particular, the ability to develop close relationships with others (Golding, 2008). With trauma occurring in childhood therefore likely to have a negative impact on the development of healthy attachment patterns, the role of attachment in relation to childhood trauma and suicide risk will now be explored. Similar to childhood trauma, attachment patterns are also considered to be a background risk factor for suicide (Adam, 1994), and thus, are posited to sit within the pre-motivational phase of the IMV model (O'Connor, 2021). A brief overview of Attachment Theory will be presented, followed by types of attachment patterns and issues with measuring attachment. Research investigating the links between childhood trauma and attachment, and attachment and suicide risk, will then be explored.

1.5 Attachment as a Background Factor for Suicide Risk

1.5.1 Attachment Theory

Attachment Theory was first proposed by John Bowlby (1969), and further developed by many contributors over the subsequent two decades, notably Mary Main and Mary Ainsworth. This widely used theory of child development focuses on how children learn, through repeated experiences, to promote closeness to primary caregivers in order to survive and thrive (Bowlby,

1969). Attachment-based relationships are hypothesised to form during childhood and develop in complexity as the child matures to adulthood (Erozkan, 2016). The theory is often used as a conceptual framework to make sense of how early experiences with caregivers impact both a child's development and their behaviour in later relationships.

Bowlby (1969) proposed that early experiences influence a person's attachment pattern via 'internal working models', which act as a framework for within which the child can make sense of themselves, and their attachment figure, thus shaping their representations of themself and others. If, for example, a child's attachment behaviour, e.g., crying, is responded to appropriately by the caregiver, most of the time, it is likely that the child will develop a *secure* attachment pattern. This secure attachment relationship sees the caregiver acting as a *secure base*; by being consistently available, the child is able to explore the world knowing that when they return their caregiver will be available, both physically and emotionally (Bowlby, 1988). This relationship results in the child learning that they are worthy of care, and that others are predictable and trustworthy (Ainsworth et al., 1978). However, children who are not responded to appropriately may develop negative representations of themselves and others, known as *insecure* attachments patterns.

1.5.2 Insecure Patterns of Attachment

The two categories of insecure attachment commonly used to help understand how children and adults behave in relationships, are *insecure-avoidant* and *insecure-ambivalent/anxious* (Ainsworth et al., 1978). An insecure-avoidant attachment pattern is understood to form when caregivers are unable to respond to their child's needs; the child experiences this as rejecting and subsequently learns to minimise their attachment-seeking behaviours. Adults with this attachment orientation tend to be task-focussed, avoidant of intimacy and may suppress their feelings (Golding, 2008). The insecure-ambivalent/anxious attachment pattern is formed through caregivers responding in an inconstant manner, resulting in the child maximising their attachment-seeking behaviours to ensure that their caregiver responds. Adults with this attachment pattern will likely have a fear of rejection or abandonment, and may be jealous and possessive within their relationships (Golding, 2008).

A later insecure '*disorganised*' category was considered by Main and Solomon (1986), understood to develop when an child has experienced abuse or trauma, to the extent that the caregiver may become frightening to the child. This is considered to form from a combination of high levels of both insecure-anxious *and* insecure-avoidant attachment (Bartholomew & Horowitz, 1991). A

conflict is created whereby the child wants to seek comfort from the caregiver, yet the caregiver is the cause of the distress (Golding, 2008). In adulthood, these individuals may interpret kindness and care from others as frightening, and may find it difficult to meet the needs of their own children (Golding, 2008).

Thus far, attachment has been discussed in the context of the child-caregiver relationship, however Hazan and Shaver (1987) posited that romantic love in adulthood parallels the typology generated by Ainsworth et al (1978), where 'secure' adults experience their romantic relationships as happy, friendly and trusting. Individuals with avoidant attachment patterns may be independent and less invested in their relationships, where an anxiously-attached individual might be, conversely, more interested and preoccupied with their romantic relationships (Hazan & Shaver, 1987).

With a lack of longitudinal research into attachment patterns over time, there is debate over the extent to which attachment patterns remain stable, versus whether there is scope for change (Gillath et al., 2016). Bowlby (1973) suggested that attachment patterns remain relatively stable once formed, and there is research in support of this across childhood (Erickson et al., 1985; Opie et al., 2021). However, there is also evidence suggesting that attachment patterns are amenable to change, and may be modified. Chopik et al (2013) conducted a large-scale study with over 23,000 individuals to determine changes in adult attachment, finding that older individuals were generally less anxious in romantic relationships, yet slightly more avoidant, than those younger than them. Similar findings were reported in a separate study assessing attachment patterns over time for non-romantic relationships (Hudson et al., 2015); attachment anxiety was seen to decrease over time, yet avoidance remained stable. Psychotherapy, where the therapist is seen as the 'secure base' for the client, has also been shown to improve attachment patterns (Taylor et al., 2015). The evidence therefore suggests that, although attachment patterns appear to remain moderately stable over time, there may be scope for change.

1.5.3 Measuring Adult Attachment

Ways of conceptualising, and therefore measuring, adult attachment have seen a recent shift from the traditional categorical prototypes outlined above, to continuous dimensions. This comes as a result of research showing individual attachment patterns to be more nuanced than categorical classification allows, and criticised for not acknowledging variation between individuals assigned to the same category (Chopik et al., 2013). Importantly, research has shown that variation in

attachment styles are continuously distributed (Collins & Read, 1990; Fraley & Waller, 1998; Fraley & Spieker, 2003), conceptualised on a two-dimensional scale of anxiety and avoidance (Bartholomew & Horowitz, 1991). An extensive factor analysis containing items from all known self-report measures of adult attachment confirmed these two global dimensions of anxiety and avoidance (Brennan et al., 1998). Where categorical measures would include two additional patterns – 'secure' and 'disorganised' attachment, these are redundant in the dimensional approach, with lower levels of both anxiety and avoidance being indicative of secure attachment, and higher levels of both representing disorganised attachment. However, despite research showing no evidence for a true attachment typology (Fraley & Waller, 1998), suggesting that using categorical measures loses meaning, new research studies continue to assign adults to discrete categories (Green et al., 2020). The current research therefore intends to consider attachment as a continuous variable, on a two-dimensional scale of attachment-related anxiety and attachment-related avoidance, where greater anxiety or avoidance are indicative of more insecure attachment (see section 2.4.3).

1.5.4 The Relationship Between Childhood Trauma and Attachment

It has been suggested that the most damaging influence on an attachment relationship is trauma during childhood, which effects the normal developmental process of the child (Fonagy, 2010). As discussed, following the observation that some children appear to demonstrate disorganised behaviours when trying to illicit care from the caregiver (Main & Morgan, 1996; Main & Solomon, 1986), the 'insecure-disorganised' attachment pattern was generated. If a caregiver does not have a healthy relationship with their own feelings, it is likely that they may find these same feelings difficult to stand in their own children (Gerhardt, 2004). Therefore, depending on their caregiver's response, children consequently learn to adapt their behaviour, so might learn to hold back their feelings, exaggerate them, or become afraid of them (Gerhardt, 2004) in order to seek attachment with their caregiver. An unintended consequence of this protective behaviour is the emergence of persisting maladaptive attachment patterns, which can affect wellbeing later in life. In fact, unprocessed trauma is understood to interrupt the child's developmental trajectory and impact subsequent relationships, to the extent that abused children may show a preference for relationships which will produce new traumas (Roberts et al., 2013). To summarise, childhood trauma may impact the formation of attachment patterns, with trauma consistently showing to increase the likelihood of having less secure attachment patterns in adulthood (Fuchshuber et al., 2019; Yumbul et al., 2010); in particular, fearful, preoccupied (anxious) and dismissing (avoidant) attachments

(Erozkan, 2016). This relationship is demonstrated in individuals both with and without diagnosed psychiatric disorders.

1.5.5 The Relationship Between Attachment and Suicide

Although early psychological theories looked to understand suicidal behaviours in relation to developmental concepts, the first known model to identify the attachment system as a central mechanism in suicide risk was not proposed until 1994. Adam's (1994) developmental model is rooted in Attachment Theory and posits that suicidal behaviour is, in essence, an acute attachment behaviour; a way of signalling distress to an unresponsive attachment figure. This proposed pathway is less well researched than the leading suicide models and theorises that the relationship between the parenting style someone experienced as a child and their adult suicidal behaviour, is mediated by internalised working models and differences in traits such as emotion regulation skills. The model suggests that when an insecurely attached person experiences painful feelings, such as rejection and loss, anxiety and hopelessness follow which may result in an attachment crisis and suicidal behaviour. Therefore, Adam's (1994) model understands attachment to operate as a background risk factor which, in turn, influences psychological states and traits, leading to suicidality.

Recent systematic reviews have explored the relationship between attachment and suicidality in adults and adolescents (Miniati et al., 2017; Zortea et al., 2019). Some research has found that preoccupied (anxious) attachment styles are related to suicidal ideation (Riggs & Jacobvitz, 2002) and behaviours (Lizardi et al., 2011; Zeyrek et al., 2009). Conversely, other studies conclude that having an avoidant attachment style predicts increased risk of suicidality (Grunebaum et al., 2010; Palitsky et al., 2013). Importantly, this relationship between insecure attachment and suicidality has been shown when controlling for key variables known to increase the likelihood of suicidality, such as mental health diagnoses, self-esteem, and sociodemographic factors (Palitsky et al., 2013; Zortea et al., 2019). Furthermore, individuals who may be classified as having a more secure attachment are less likely to experience suicidal ideation or intent, which suggests being securely attached may act as a protective factor (Palitsky et al., 2013; Zortea et al., 2019). To summarise, research shows that insecure attachment is associated with a greater risk of suicide (Palitsky et al., 2013), however it appears the type of attachment associated with suicidality may differ between populations, and may also reflect the different ways attachment can be measured. In support of the current literature, a broad hypothesis of this study is therefore that:

- **Higher levels of attachment anxiety and avoidance will be associated with a history of suicidality (ideation and attempts).**

Summary

Discussed so far is a growing body of research highlighting the role of childhood trauma, and to a lesser extent, insecure attachment patterns, as risk factors for suicidality. Although a range of models of suicide exist, each with empirical support, few refer to the role of attachment, and Adam's (1994) developmental model fails to conceptualise specifically how attachment might be located in the leading suicide models. However, attachment is proposed as a background factor in the pre-motivational phase of the IMV model (O'Connor, 2011; Zortea et al., 2019).

The central argument of the IMV model is that background, pre-motivational factors lead to suicidal ideation through their impact on motivational phase factors (See Figure 1; O'Connor & Kirtley, 2018). Since research has called for studies to investigate both background and proximal risk factors simultaneously in suicide research (O'Connor et al., 2020), it therefore follows that this research should focus on understanding childhood trauma and attachment, both background factors, in relation to proximal risk factors; in particular, proximal factors situated in the 'motivational phase' of the IMV model. Key proximal risk factors, with strong empirical data in support of their association with suicidality, will now be summarised to inform the direction of the current study.

1.6 The Role of Proximal Risk Factors in Suicide

The IMV model posits that the core psychological states of both defeat and entrapment are central to the motivational phase of suicide, which sees the development of suicide ideation (O'Connor & Portzky, 2018; Taylor et al., 2011). Defeat and entrapment will now be outlined in relation to suicide risk.

1.6.1 Defeat

Defeat is understood as the sense of having attempted to overcome a stressful situation, but having failed in this effort (Taylor et al., 2011); importantly, it is in relation to an internal aim, as opposed to something externally appraised (Ehlers et al., 2000). There is robust evidence demonstrating the relationship between defeat and suicide risk (Höller et al., 2020). A large meta-analysis exploring

perceptions of defeat and entrapment showed a large effect size (Cohen, 1988) for the relationship between both constructs, and suicide risk, in a population with diagnosed psychiatric disorders (Siddaway et al, 2015). This link has also been shown in the general population, with people who experience suicidal ideation feeling significantly more defeated than those who do not (Branley-Bell et al., 2019). Furthermore, this relationship has also been indicated longitudinally, with perceptions of defeat in people with bipolar disorder significantly predicting suicidal ideation after four months (Owen et al., 2018).

1.6.2 Entrapment

There is also clear evidence for the relationship between entrapment, experienced as a sense of there being no escape from a negative situation - often stressful and chronic life events (Harris et al., 1995), and suicide risk. For example, a longitudinal study published in 2013 (O'Connor et al., 2013) followed patients who had been admitted to hospital four years prior, due to a suicide attempt. At the time of admission psychological measures, including entrapment, were administered. Four years later, feelings of entrapment at the time of the admission, as well as having a history of suicidal behaviour, best predicted who had proceeded to attempt suicide again, or had died by suicide. This provides evidence that people attempt suicide or die by suicide when they see no other way out of their pain; they feel trapped and aren't able to see an alternative escape (O'Connor & Kirtley, 2018).

In addition, and in accordance with the IMV model, entrapment has shown to mediate the relationship between feelings of defeat, and suicidal ideation. This association has been found cross-sectionally, in university students (Wetherall et al., 2019), as well as at one-month follow-up in adults from the general population (Branley-Bell et al., 2019), and at four-month follow-up in adults with a diagnosis of bipolar disorder (Owen et al., 2018). This therefore suggests that this mechanism is universally important in the pathway to suicide.

1.6.3 Stress

Fundamental to all diathesis-stress models, is indeed the role of stress. Importantly, stress is considered to interact with background variables, and as discussed above, trigger feelings of defeat and entrapment (O'Connor, 2011; O'Connor & Kirtley, 2018; Taylor et al., 2011). According to the IMV model, stress is a background factor located within the pre-motivational phase of suicide, however, unlike childhood trauma and attachment patterns, feelings of stress are known to vary on a

day-to-day basis (O'Connor & Ferguson, 2016), and therefore, may also be considered a proximal risk factor.

Research has shown that people who attempt suicide exhibit a blunted stress response, releasing less cortisol when waking in the morning and in response to an acute laboratory stressor, compared to those who are not suicidal (O'Connor et al., 2017; O'Connor et al., 2020). Indeed, much of the stress literature focusses on this hormonal measurement of stress in relation to suicidality, in individuals who had previously engaged in suicidal behaviours or who have experienced recent suicidal ideation. However, perceived stress has also repeatedly been shown to correlate with suicidal ideation and behaviours, in that the higher the self-reported stress, the more common suicide ideation and behaviours (Asghari et al., 2013; Hirsch et al., 2019). However, despite strong evidence, the majority of research into the impact of perceived stress on suicide risk uses college populations (Asghari et al., 2013; Hirsch et al., 2019; Hirsch & Ellis, 1996) or specifically adolescents (Chen & Kuo, 2020; Singh & Pathak, 2018), thus lacks generalisability.

Summary

With background risk factors understood to impact suicide risk through 'motivational phase' factors, it is hypothesised that higher levels of childhood trauma and poorer attachment patterns will be associated with daily defeat and entrapment. Stress is also a key background risk factor thought to interact with other pre-motivational phase factors and impact suicidal ideation through defeat and entrapment (O'Connor, 2011; O'Connor & Kirtley, 2018). Therefore, it is also hypothesised that childhood trauma and poorer attachment will be associated with daily stress.

Further to this, individuals at risk of suicide report significantly higher levels of defeat and entrapment with respect to a recent stressful event, than those less at risk (O'Connor, 2003). Given this apparent mechanism whereby stress impacts suicide risk via feelings of defeat and entrapment, this study therefore also aims to investigate the impact of childhood trauma, and attachment, as moderators of the daily stress-defeat and daily stress-entrapment relationships (known as 'within-person' slopes i.e., stress-defeat slope and stress-entrapment slope). This will ensure that meaningful associations, key to the suicide pathway, are not masked. In summary, further hypotheses of the study are therefore:

- **Higher levels of childhood trauma will be associated with higher levels of daily defeat, entrapment and stress, and childhood trauma levels will moderate the stress-defeat and stress-entrapment slopes.**

- **Higher levels of attachment anxiety and avoidance will be associated with higher levels of daily defeat, entrapment and stress, and attachment anxiety and avoidance levels will moderate the stress-defeat and stress-entrapment slopes.**

Presented thus far is research showing that childhood trauma increases the likelihood of suicidality. Separate from this, the role of attachment in relation to trauma and suicidality has been explored, showing that insecure attachment patterns are associated with both a history of childhood trauma, and an increased risk of suicide. The role of stress, along with defeat and entrapment from the 'motivational' phase, have also been explored as important proximal risk factors for suicidality.

1.7 Gaps in the Literature

What is yet to be investigated here, is how attachment may play a role as a third variable, i.e. a moderator or mediator, in the well-established childhood trauma-suicide relationship. Given the strong association between attachment and childhood trauma (Erozkan, 2016; Fuchshuber et al., 2019), recent research advises that this be explored (Stagaki et al., 2022; Zortea et al., 2020).

A small selection of studies support the role of attachment as a mediator of this relationship, suggesting that less secure attachment patterns may help to explain the mechanism via which childhood trauma may lead to later suicidality. Research supports this mediating role of attachment in the trauma-suicide relationship when measuring suicide directly (Allbaugh et al., 2018; Restrepo et al., 2016; Stagaki et al., 2022; Touati et al., 2021), but also when measuring risk factors for suicide - notably stress (Santorelli et al., 2012), and hopelessness (Gaskin-Wasson et al., 2017). However, only one study is known to have investigated attachment as a *moderating* variable in the context of childhood trauma and suicide. Smith et al (2012) showed that avoidant attachment moderated the relationship between social maladjustment domains and suicidal ideation, specifically in women who had experienced trauma in childhood. However, trauma was not included as a variable in the analyses, and therefore the moderating role of attachment on the childhood trauma-suicide relationship was not explored directly.

It is also worth noting that research investigating attachment as a mediating or moderating variable is limited in several respects. The majority of studies include only female participants (Gaskin-Wasson et al., 2017; Smith et al., 2012), and often involve those from especially niche ethnic and social backgrounds, such as African-American women (Allbaugh et al., 2018; Santorelli et al., 2012). This makes generalising the results to wider populations difficult and means findings may be at risk of identifying a culturally specific pathway. In addition, all identified mediation and moderation studies have adopted a cross-sectional design, limiting the ability to infer causal pathways. Furthermore, there is a tendency for research studies to recruit from clinical populations (Gaskin-Wasson et al., 2017; Qiu et al., 2017; Smith et al., 2012), that is, those who were recruited because they are under the care of, or in contact with, a support service, such as psychiatric and medical services. Given that nearly three quarters of people who die by suicide are not in contact with mental health services in the year prior (Healthcare Quality Improvement Partnership, 2021), there is a need to understand suicide pathways in the general population.

Summary

There is some research to suggest that attachment may play a mediating role in the relationship between childhood trauma and suicidality, yet research has not explicitly investigated attachment as a moderator of this relationship. Literature suggests that although attachment styles have their origins in childhood experiences, and therefore adverse experiences in childhood are extremely influential in shaping attachment, more recent interpersonal experiences may also be influential to one's attachment style (Fraley & Roisman, 2019; Girme et al., 2018). Therefore, investigating the moderating effect of attachment, that is, whether attachment anxiety and avoidance may strengthen or weaken the childhood trauma-suicide association, will help us understand when this association occurs, and if the development of positive, secure attachments in adulthood may be able to buffer the impact of childhood trauma on later suicide risk.

The current study therefore aims to test this, and hypothesises that:

- **The effects of childhood trauma on history of suicidality will be stronger in those scoring higher in attachment anxiety and avoidance.**

As mentioned previously, research needs to look at background and proximal risk factors together. Therefore, this study also aims to investigate attachment as a moderating factor between childhood

trauma and daily risk factors for suicide. Specifically, whether attachment patterns moderate the relationship between childhood trauma and stress, defeat and entrapment. In addition, this study aims to assess whether attachment patterns moderate the relationship between childhood trauma and these risk factors as daily slopes. The final hypotheses are therefore as follows:

- **The effects of childhood trauma on daily stress, defeat and entrapment will be stronger in individuals who score higher in attachment anxiety and avoidance.**

- **The effects of childhood trauma on daily stress-defeat and stress-entrapment slopes will be stronger in individuals who score higher in attachment anxiety and avoidance.**

1.8 Need for Daily Diary Approaches

As is concluded from Franklin et al's (2016) meta-analysis, scrutinising findings from five decades worth of suicide research, methodological limitations of suicide research prevent research findings from reliably informing suicide theory, prediction and treatment. Franklin et al (2016) recommend that suicide risk improves by including short follow-up intervals and by measuring constructs repeatedly. These points shall now be discussed, in relation to how the present study will address these.

As mentioned, much of the current suicide literature, including all studies presented previously which include attachment as a third variable, assesses risk factors for suicide using a cross-sectional design. This provides information based on a snapshot in time, restricting the ability to infer causal or temporal pathways (Myin-Germeys et al., 2009), and offers limited information about within-person processes. Further to this, suicide research often asks participants to recollect past emotional or physical experiences, posing the issue of recall bias. In order to capture short term variability in suicide risk factors, techniques such as ecological momentary assessments (EMA) and daily diary methods are recommended where participants provide data at short time intervals (Davidson et al., 2017; Stenzel et al., 2020). These ‘micro-longitudinal’ studies are needed to examine risk factors for suicide over shorter time periods (Klonsky et al., 2018; Stenzel et al., 2020), since studies have shown that suicidal ideation and its risk factors vary dramatically, even within a 4-8 hour period (Kleiman et al., 2017). However, this method of data collection has been rather neglected in suicide research thus far (Davidson et al., 2017).

To address these shortcomings, this study therefore adopted a novel daily diary design to collect data about experiences of proximal risk factors for suicide (daily levels of defeat, entrapment and stress) over a prolonged study period, alongside the completion of the attachment and childhood trauma background measures. This approach allows proximal risk factors to be measured repeatedly, with daily follow-up intervals capturing within-person variations. In addition, this permits higher ecological validity than traditional cross-sectional studies, since responses are provided in real time (Shiffman et al., 2008), and recall bias is reduced (Solhan et al., 2009). This 'within-person' approach allows intraindividual processes to be detected, that is, what is happening *within* an individual, as opposed to observing what is occurring across a set of individuals (interindividual processes) and applying that to the individual (Curran & Bauer, 2011). Whilst collecting data in this way is somewhat rare, it has been effective in previous suicide research (Kleiman et al., 2017; Lazarus & Shahar, 2018; O'Connor et al., 2020; Stenzel et al., 2020).

As mentioned, research investigating factors involved in suicide in participants recruited from the general population, via non-clinical routes, is critical. Whilst college or university students are often more available to take part in research, they represent a limited proportion of total suicides, and previous suicide research recommends that research is replicated in non-student populations (Dhingra et al., 2015). Further to this, it has been highlighted that attachment research often uses only female participants. Whilst the 'gender paradox' exists, whereby females are more likely to experience thoughts of suicide and attempt suicide (McManus, Hassiotis, et al., 2016), it remains the case that males are more likely to die by suicide (ONS, 2020). Therefore, this research therefore looks to include both male and female adults from the population.

1.9 Summary and Review of Hypotheses

This study aims to be the first to investigate attachment as a moderating factor between childhood trauma and suicide risk, in a non-clinical population. Additionally, it is also the first known study to investigate attachment in relation to suicide risk using a daily diary design, monitoring risk factors daily, in combination with background measures. This research also adopts an innovative way of measuring attachment in response to critique of current attachment conceptualisation. To conclude this chapter, the preregistered research hypotheses will be presented a final time.

Firstly, the research aimed to investigate the relationship between childhood trauma, attachment and suicidality, cross-sectionally. It was predicted that:

1. **Higher levels of childhood trauma, attachment anxiety and attachment avoidance will be associated with a history of suicidality (ideation and attempts).**

2. **The effects of childhood trauma on history of suicidality will be stronger in those scoring higher in attachment anxiety and avoidance (i.e. moderated by attachment).**

Further aims of the research were to consider the effect of childhood trauma and attachment both on the risk factors for suicide (daily stress, defeat and entrapment) and the relationship (slopes) between the risk factors, at the daily level. It was predicted that:

3. **Higher levels of childhood trauma will be associated with higher levels of daily defeat, entrapment and stress and childhood trauma levels will moderate the stress-defeat and stress-entrapment slopes.**

4. **Higher levels of attachment anxiety and avoidance will be associated with higher levels of daily defeat, entrapment and stress, and attachment anxiety and avoidance will moderate the stress-defeat and stress-entrapment slopes.**

The final two aims of this research were to investigate the impact of attachment anxiety and avoidance as moderating factors in the relationship between childhood trauma and both the daily risk factors for suicide, as well as the slopes. It was predicted that:

5. **The effects of childhood trauma on the daily risk factors for suicide will be stronger in individuals who score higher in attachment anxiety and avoidance, compared to those who score lower.**

6. **The effects of childhood trauma on daily stress-defeat and stress-entrapment slopes will be stronger in individuals who score higher in attachment anxiety and avoidance, compared to those who score lower.**

2.0 Method

2.1 Overview

This chapter outlines the methods used to test the hypotheses outlined and, specifically, will discuss the participants, research design, materials used and procedure. Finally, the statistical analyses are outlined.

2.2 Participants

2.2.1 Recruitment

The recruitment of participants took place between the end of May and beginning of November 2021. Recruitment occurred through two separate advertising posters to ensure individuals who had experienced suicidal thoughts, or had made suicide attempts, were recruited into the study, alongside participants without suicide experiences. This method has proven effective in recruiting participants in similar suicide research studies (O'Connor et al., 2020).

One poster focused specifically on attracting those with a history of suicidality (Appendix A), by asking people to take part if they had 'been feeling low' recently. A second poster was used to recruit participants who may not have experienced suicidality (Appendix B) by advertising a study interested in 'childhood experiences, relationships and personality'. The posters presented a brief overview of the research and contained a QR code to scan or a URL to follow, in order for participants to sign-up. Although recruitment occurred via the two separate adverts, responding to either of these resulted in participants taking part in the same study, and they were analysed as one population.

Recruitment was organised via a variety of different channels. The posters described were advertised online via social media platforms e.g., Twitter, Facebook and LinkedIn, via websites e.g., Gumtree, Reddit and MQ, and displayed in public communal areas. Posters advertising the study were also displayed on the University of Leeds campus, and students of the University of Leeds could sign up to the study via the undergraduate Participant Pool scheme.

2.2.2 Exclusion Criteria

The participants were asked three questions to address suitability. If they did not understand English, were under 18, or had either attempted suicide or experienced thoughts to end their life within the last 4 weeks, they were informed that they were not able to take part in the study. If the latter criterion was met, participants were also advised that this was due to the increased risk of distress associated with completing the required measures, thanked for their time and consideration, and directed to professional and voluntary support organisations.

2.2.3 Demographic Information

Phase One (Background Measures)

Four hundred and eighty-nine participants completed the first phase of the study, however, eight people were excluded; seven due to having made attempts or experienced thoughts to end their life within the past four weeks, and one person who could not understand written English. The remaining 481 participants were included in phase one analysis. Demographic information of these participants is presented in Table 1.

Table 1

Demographic information of participants who completed background measures (N = 481)

Characteristic	Frequency (n)	Percentage (%)
Age (*SD*) [a]	31.82 (12.93)	
Gender		
Male	93	19.3
Female	370	76.9
Transgender Male	2	0.4
Transgender Female	2	0.4
Non-Binary/Non-Conforming	14	2.9
Ethnicity		
Asian or Asian British	21	4.4
Black, African, Black British or Caribbean	12	2.5
Mixed or multiple ethnic groups	22	4.6
White	415	86.3
Other	6	1.2
Prefer not to say	5	1
Occupation		
In paid employment	255	53
Self employed	28	5.8
Full time student	141	29.3
Unemployed, seeking work	16	3.3
Unemployed, not seeking work	23	4.8
Retired	18	3.8

[a] Age range = 18 – 82 years.

Phase Two (Daily Diary)

Of the 481 participants who completed phase one, 312 proceeded to the second daily diary phase. As is explained in section 2.6, due to the exclusion criteria, data from only 243 of these 312 participants was included in analysis. Demographic information for phase two participants is provided in Table 2.

Table 2

Demographic information of participants who completed the daily diary (N = 243)

Characteristic	Frequency (n)	Percentage (%)
Age (*SD*)	31.92 (13.52)	
Gender		
Male	45	18.5
Female	192	79.0
Transgender Male	1	0.4
Transgender Female	1	0.4
Non-Binary/Non-Conforming	4	1.6
Ethnicity		
Asian or Asian British	11	4.5
Black, African, Black British or Caribbean	2	0.8
Mixed or multiple ethnic groups	10	4.1
White	217	89.3
Other	2	0.8
Prefer not to say	1	0.4
Occupation		
In paid employment	116	47.7
Self employed	12	4.9
Full time student	83	34.2
Unemployed, seeking work	3	1.2
Unemployed, not seeking work	11	4.5
Retired	18	7.4

2.3 Research Design

The first phase of the study adopted a cross-sectional design, whereby participants were asked to complete an initial questionnaire consisting of background measures. The second phase of the study used a daily diary design, which involved participants completing a brief daily diary, each day, for seven consecutive days.

Combining both methods of data collection is a novel way of collecting data, appropriate for exploring historical experiences and trait characteristics (between-participant factors), alongside daily state variables (within-participant processes). To minimise participant drop-out, the daily diary surveys were brief, and links to the diaries were text messaged to each participant on each day of the study, reducing participant burden. Following study completion, participants were presented with the option to be entered into a prize draw, offering the chance to win one of 10 x £20 shopping vouchers.

The study hypotheses and statistical analyses were preregistered (registration number: 82127) via AsPredicted (the preregistration can be accessed at https://aspredicted.org/see_one.php). Whilst the data was collected prior to registration, the data was not viewed, and therefore analysis did not commence, until after preregistration.

2.3.1 Power Calculation

The sample size was determined using a summary-statistics-based power analysis to detect a cross-level effect, informed by a previous unpublished study dataset (following the approach outlined by Murayama et al., 2021). The power analysis showed that a minimum sample of 236 were required to achieve 80% power ($t = 2.18$, $df = 140$). Therefore, to account for attrition and drop out between the study phases, the study aimed to recruit 300 participants.

2.3.2 Ethical Clearance

Ethical approval was gained from the University of Leeds, School of Psychology Ethics Committee on the 18th May 2021 (PSYC-270). Please refer to Appendix C for the ethical approval email.

2.4 Materials

The measures used in both study phases, and the rationale for adopting these, will now be outlined. All measures were administered via OnlineSurveys (Previously Bristol Online Survey) software. The measures chosen were informed by the literature and shorter scales used where possible to ensure that the demand on participants was kept to a minimum, particularly for the daily diary.

Background Measures (Phase One)

2.4.1 Childhood Trauma Questionnaire (CTQ; Bernstein et al., 2003)

The CTQ (see Appendix D) is a widely used 28-item self-report inventory used to gain information about history of childhood abuse or neglect. The questionnaire includes five scales which assess different types of trauma: emotional abuse, physical abuse, sexual abuse, emotional neglect, and physical neglect. Each of the scales is assessed using five items, with participants being asked to determine the extent to which each statement, e.g., 'People in my family said hurtful or insulting things to me', was true for them during childhood. The measure also contains a 3-item validity scale, to detect minimisation and denial. Participant responses are provided on a Likert-scale format, with responses ranging from 1 (never true) to 5 (very often true). Since the current research was interested in obtaining a general childhood trauma score, individual scale scores were not calculated. Reverse worded questions were transformed, and the total CTQ score computed by summing the 25 items, omitting the three validity scale items. Therefore, the range of possible total CTQ scores was 25-125, with the greater the score indicating a greater history of childhood trauma.

The five-factor structure has shown to offer a good fit for both clinical and non-clinical groups (Bernstein et al., 2003). Analyses using a community sample, similar to the current study, have shown high internal consistency ($\alpha = .91$) (Scher, Stein, Asmundson, et al., 2001). The internal reliability for the total CTQ in the current sample was $\alpha = .95$.

2.4.2 Suicide History Questions (Adapted from the Adult Psychiatric Morbidity Survey (APMS; McManus et al., 2009)

With the research aiming to investigate factors associated with thoughts of suicide, as well as suicide attempts, questions asking about these experiences were required. Whilst many measures of

suicidal thoughts and behaviours exist, such as the BSSI (Beck et al., 1979), they are generally lengthy and ask about suicide in greater depth than is required for this study.

The APMS (McManus, Bebbington, et al., 2016) is a general population survey used to collect data on the prevalence of treated and untreated mental health problems in adults. Two items from this survey were used due to their ability to discriminate between those who have had thoughts to end their life, and those who have acted on these thoughts: 'Have you ever seriously thought of taking your life, but not actually attempted to do so?' and 'Have you ever made an attempt to take your life, by taking an overdose of tablets or in some other way?'. Response options were 'yes', 'no', or 'prefer not to say'. These questions have been widely used in suicide research (Cleare et al., 2018; O'Connor et al., 2021; Wetherall et al., 2018) and offer a clear and unambiguous way to differentiate between suicide ideation and attempts.

2.4.3 The Experiences in Close Relationships-Relationship Structures (ECR-RS; Fraley et al., 2011)

Considering the research aimed to investigate the role of attachment in the established relationship between childhood trauma and suicidality, a robust measure of attachment was required. Although the Adult Attachment Interview (George et al., 1985) is deemed the most reliable and valid way of measuring attachment (Ravitz et al., 2010), it is lengthy, and requires face to face administration.

Since research has suggested that attachment styles are continuously distributed, and are positioned on a two dimensional scale of anxiety and avoidance (Bartholomew & Horowitz, 1991; Collins & Read, 1990), a measure accounting for this was adopted. Fraley (personal communication, November 2, 2020), suggested using the ECR-RS for this research (see Appendix E), as a way to measure attachment using a continuous rather than categorical scale, as well as to capture general attachment as opposed to attachment specifically in romantic relationships. The 36-item measure conceptualises attachment on a two-dimensional scale of attachment-related anxiety and attachment-related avoidance, and is designed to target attachment styles in a variety of relational contexts.

The authors of the ECR-RS selected 9 items from the earlier Experiences in Close Relationships-Revised (ECR-R) questionnaire (Fraley et al., 2000) that possessed good item discrimination but were not worded with a romantic focus (Fraley et al., 2011). Three of these items measure attachment anxiety e.g., "I often worry that this person doesn't really care for me", and six measure

attachment avoidance e.g., “I prefer not to show this person how I feel deep down”. Responses are provided on a seven-point Likert scale from 1 (strongly disagree) to 7 (strongly agree), and the nine items are repeated four times to assess attachment avoidance and anxiety in relation to four key attachment figures: mother or mother-like figure; father or father-like figure; best friend and partner. If not in a dating or marital relationship, participants are asked to think of a former partner or relationship they would like to have with someone. Attachment anxiety and avoidance scores are generated for each relationship target. The avoidance score is computed by averaging items 1 - 6, whilst reverse scoring items 1 - 4, and the anxiety score is computed by averaging items 7 - 9.

To create a relationship-general attachment avoidance and attachment anxiety score, Fraley and colleagues suggest administering the same 9-items once more, with a more general phrasing e.g. “it helps to turn to ‘people’ in time of need”, *or* averaging the anxiety and avoidance scores across the four relationship domains (Fraley, 2014). Instructing participants to consider relationships ‘in general’ is ambiguous and people report different attachment patterns in different relationships (Baldwin et al., 1996). Therefore, assessing attachment separately for different attachment figures and then averaging anxiety and avoidance scores across the four relational domains, to create two composite scores, was considered appropriate for this research. This method has been adopted in previous research (e.g., Fraley et al., 2006) where, as with this study, differential predictions were not made about attachment patterns across different relationship domains. Whilst weighting relationships equally makes it hard to study how general and relationship-specific attachment representations change together (Fraley, 2014), this is not considered problematic for this research which is interested only in general attachment. The alpha reliability estimates of the ECR-RS are highly comparable to those from longer attachment scales in the literature (Fraley et al., 2011).

Internal reliability for relationship-specific attachment anxiety and avoidance scores in the current sample are high. Cronbach’s alpha for attachment anxiety and avoidance in relation to the mother are .87 and .94 respectively, in relation to the father are .91 and .93 respectively, in relation to the romantic partner are .92 and .90 respectively, and in relation to the best friend are .93 and .90 respectively.

Along with the administration of these background measures presented, personal characteristics of the participants were collected during phase one, and included age, gender and ethnicity. Such variables have been cited in the literature as being related to attachment style and suicidality, and so it was important to be able to assess the influence of such factors.

Daily Diary Measures

2.4.4 Defeat and Entrapment

With robust evidence demonstrating that defeat and entrapment are associated with suicidal ideation and attempts (Höller et al., 2020; Siddaway et al., 2015), both constructs were assessed using single items within the daily diary: "To what extent have you felt trapped today?" and "To what extent have you felt defeated today?". Responses were given on a five-point Likert scale ranging from 1 (not at all/very little), to 5 (extremely). Both items possess good face validity and have been used successfully in previous research (O'Connor et al., 2020).

2.4.5 Perceived Stress Scale-Brief (PSS-Brief; Cohen et al., 1983)

With research highlighting the role of stress in suicide risk, and with stress having shown to influence defeat and entrapment (O'Connor, 2003), a stress measure was administered as part of the daily diary. The PSS-Brief (Appendix F) is a short, 4-item self-report questionnaire measuring perceived stress, adapted from the original 14-item scale (Cohen et al., 1983)**.** Responses are provided on a five-point Likert-scale from 1 (never) to 5 (often), and total stress scores generated by summing the four items. Internal consistency has shown to be sufficient for a four-item scale (Vallejo et al., 2018). The original item wording was amended to ask about perceived stress over the course of the day, rather than over the past month, e.g., "*Today*, how often did you feel difficulties were piling up so high that you could not overcome them?". Although psychometrics have not been collated for using the PSS-Brief to ask about stress over a shorter time period, the authors of the measure suggest that the longer the retrospective period the less accurate reporting, and so, asking about shorter time periods is not problematic (Cohen et al., 2014). A recent study modified the measure in this way, and stated acceptable within-person internal reliability, in a similar population (O'Connor et al., 2020). The internal reliability for the total stress score in the current sample was $\alpha = .82$.

Finally, data collection was shared with a second thesis project; see Appendix G for the two additional measures administered as part of the second project.

2.5 Procedure

2.5.1 Ethical Considerations

The primary ethical issues considered in relation to this study were: ensuring participants understood what the study entailed, to gain informed consent; managing the risk of participant distress and mitigating against this; ensuring participants were aware of their right to withdraw from the study and finally, ensuring that confidential participant data was stored securely.

Informed consent

Participants were encouraged to read through detailed information outlining the study, prior to providing consent (Appendix H and I). This information specified what the study required of them, the possible risks and benefits associated with participating, how to withdraw, and management of the data collected. Participants were given the option of returning to view this information at a later stage, should they wish to take time to consider their participation.

Participant distress

Due to the sensitive nature of the measures included in the study, such as those asking about childhood trauma and relationship difficulties, as well as the prolonged study period with no researcher contact, there was a risk of participant distress. It was assumed that levels of distress would be greatest in individuals who had experienced suicidal ideation or attempted suicide historically. To mitigate against any possible distress, the following processes were therefore implemented:

- Screening for vulnerable individuals at the beginning of the study to ensure that those with very recent suicidal thoughts or behaviours did not participate.
- The participants' right to withdraw was emphasised in the participant information sheet, which encouraged participants to dropout if they experienced a deterioration in their mental health during the study.
- Each day after completing the daily diary, participants were provided with information about how they could seek support if required (Appendix J).

- If participants used the research study email address to express distress, or disclose distressing experiences, the researchers responded with the support information and reminded the participant of their right to withdraw from the study.

Although there is an assumption that asking about suicidality might 'prime' individuals, making them more likely to experience suicidal thoughts or engage in suicide behaviours, research (see Blades et al., 2018 and Dazzi et al., 2014) has shown that asking about suicide leads to small reductions in suicidal ideation and a lower likelihood of engaging in suicidal behaviour. It is also important to note that research has shown that participants who take part in online suicide research may benefit from taking part, which may lead to a decrease in negative experiences as a result (Gibson et al., 2014).

Withdrawal from the study and withdrawal of data

Participants were informed that, if during the study they decided they no longer wished to continue, they could withdraw without giving an explanation by informing the researchers via the study email address. In addition, participants could also withdraw their data up to two weeks after completing the study, by emailing the study email address.

2.5.2 Phase One (Background Measures)

Data collection occurred in two distinct phases. Through scanning the QR code or following the study link, participants were directed to OnlineSurveys where they were first presented with information about the project. From here, they were asked to provide consent by clicking the 'yes' button to show agreement with each of the statements (see Appendix I).

Immediately after providing consent, participants were presented with the first phase of the study which consisted of four parts: screening for exclusion criteria, collecting demographic information, completing the set of background measures, and creating a unique study ID code. However, if not convenient for participants to complete this phase immediately after providing consent, they were given the opportunity to return at a later point.

Phase one took approximately ten minutes to complete. At the end, participants were asked to provide their mobile number in order to take part in the second phase of the study, by emailing it to

the study email address with the subject heading ‘start study tomorrow’. Once their mobile number was received, the researchers manually set up each participant to the second daily diary study phase.

2.5.3 Phase Two (Daily Diary)

A text message was sent out to each participant at 18:00 hours each evening for seven consecutive days, with each text providing a link to the daily diary presented in OnlineSurveys. Each diary consisted of the Perceived Stress Scale-Brief (PSS-Brief; Cohen et al., 1983) and the two defeat and entrapment questions. The diaries took approximately 2 minutes to complete, and upon completion, participants were presented with a range of support services to contact if they had experienced any distress.

On the 7th day of the study, the text message contained a link to a variation of the daily diary, which contained identical measures, but was followed by a debrief section marking the end of the study (see Appendix K). At this point, participants were asked to provide their email address or mobile number to be contacted on should they wish to be entered into the prize draw. Finally, participants were thanked for their participation, provided with further information about the study, and informed of how to get in touch should they wish to be informed of the research findings. The professional and voluntary support organisations were then presented a final time.

2.5.4 Pilot Study

The study was piloted on nine individuals who were asked to read through and complete the phase one link, as well as a phase two daily diary link. They were asked to provide feedback on the following areas: whether the links were user friendly; the clarity of the instructions; whether they understood the response options; whether they would know where to go to seek support, as well as suggestions of any changes. In response to feedback, changes were made: to the study instructions, e.g., making it clearer how and when participants would receive the daily diary link; to the study design, e.g., removing the option for participants to skip the demographics section, and any errors were corrected.

2.6 Data Preparation, Screening and Cleaning

Background Questionnaire Measures

Data collected from the phase one background measures were prepared for analysis through coding and reverse scoring items where appropriate. Where less than 5% of the data points were missing, the column mean replaced missing data points. New variables were generated for the total subscales and total scores for each measure, where appropriate, and interaction terms were generated for the variables involved in moderation analyses. The variables were visually screened using box plots and due to lack of significant outliers, all data points were retained in analysis.

CTQ scores were not normally distributed as seen via visual inspection of the histogram and confirmed by Shapiro-Wilk's test ($p < .001$), with a skewness of 1.158 (SE = 0.111) and kurtosis of 0.869 (SE = 0.222). A log 10 transformation was therefore applied to the data before statistical analyses which improved the skew (0.518; SE = 0.111). Attachment anxiety scores were also not normally distributed as inspected via the histogram and Shapiro-Wilk's test ($p < .001$), with a skewness of 0.840 (SE = 0.111). A log 10 transformation was also applied to the attachment anxiety variable data before statistical analyses were conducted, which diminished skewness to 0.033 (SE = 0.111). Attachment avoidance was normally distributed, as determined via the histogram. Suicide ideation and attempt responses were recoded into a yes/no dichotomy by allocating participants who chose the 'prefer not to say' option to the 'no' category.

To control for age and gender in analyses, the gender variable was re-coded into a dichotomy. Participants who identified as transgender female were assigned to the female category and transgender males assigned to the male category. Fourteen individuals who identified as non-binary were excluded from all analyses where gender was controlled for. Therefore, to summarise, non-adjusted analyses of phase two data included 481 participants data, and adjusted analyses, controlling for age and gender, included 467 participants data.

Daily Diary Measures

A number of additional exclusion criteria were applied to the phase two data collected:

- If the participant completed less than two diary entries, they were excluded from the analysis.
- Diary entries completed after 9am the following day were excluded.
- If two diary entries were completed after 9am on the same day (for example, at 10am and 7pm), the former entry was excluded.
- If diary entries were made within quick succession, the first diary entry made was retained and latter entries excluded.
- Additional diary entries completed outside of the seven-day study window were excluded.
- If the participant's response behaviour demonstrated nonadherence to the study protocol, (e.g. completing the daily diary multiples times per day), their full dataset was excluded.

From the original 312 participants who signed up to the second phase of the study, 263 participants' data was retained after the exclusion criteria were applied. The most common reason for deleting a participant's data was due to only one of the seven daily diaries being completed. Of the participant's whose data was retained for analyses, 104 had one or more of their daily diary responses deleted. The most common reason for this single diary response deletion was due to the participant completing the diary after 9am the following day. Despite this, almost half of participants included in analysis completed all 7 days of the diary. The number of daily diaries completed by participants is presented in Table 3.

Table 3

Frequency of daily diary entries completed

No. of days completed	Frequency (n)	Percentage (%)
2	12	4.9
3	19	7.8
4	24	9.8
5	29	11.9
6	49	20.2
7	110	45.3

Although 263 participants had sufficiently completed phase two of the study following the data cleaning process, only 243 of these participants were included in the analyses. This is explained by 20 participants' daily diary data not matching with a background data set i.e., they used a different unique ID code for phase one and phase two, so their phase one and two datasets could not be linked.

As with the background analyses, individuals who identified as non-binary were not included in analyses controlling for age and gender; this left 239 participants in the phase two adjusted analyses. To summarise, non-adjusted analyses using the phase two daily diary data included data from 243 participants; adjusted analyses included data from 239 participants. Therefore, four non-binary people who completed phase two were not included in the adjusted analyses.

2.7 Data Analysis

Data were analysed using IBM SPSS Statistics (Version 26; IBM Corp, 2019) and Hierarchical Linear Modelling (HLM-8; Hedeker & Gibbons, 2021). IBM SPSS Statistics was used for analyses handling only cross-sectional background data (Hypothesis 1 and 2). HLM was used to analyse cross-level effects using multilevel models (Hypothesis 3-6), due to the data containing both between-person (level two) and within-person (level one) differences.

Log transformed CTQ and attachment anxiety were used in all analyses, except from binomial regressions. All interaction analyses used mean centred values, as advised by Aiken & West (1991) in order to reduce multicollinearity, however non-transformed non-mean-centred values are presented in Table 4 for ease of interpretation. Since age and gender were significantly correlated with childhood trauma and the attachment variables (see Table 5), all analyses controlled for age and gender.

Hypotheses 1 and 2 were analysed using IBM SPSS Statistics. In order to examine the associations between the background variables of interest (childhood trauma, attachment variable and suicide history variables), Pearson's product moment correlations were used. Hierarchical linear regressions were used to assess whether these associations remained when controlling for covariates, when the dependent variables were continuous (attachment variables). Hierarchical logistic regression was used to analyse whether these associations remained once covariates were controlled for, when the dependent variables were dichotomous (suicide history variables). Hierarchical logistic regression was also used to assess whether the attachment patterns moderated the relationship between

childhood trauma and the suicide history variables. Where an interaction was significant, a median split of the moderating variable was performed (e.g., high/low attachment avoidance, high/low attachment anxiety) and the effect of childhood trauma on the suicide history variables was run for each group.

Hypotheses 3-6 were analysed using multilevel modelling in HLM, since this allows for analyses of both within-person and between-person processes, and because the data consisted of a two-level hierarchical structure. Level one data captured the within-person variation of the daily diary variables (stress, defeat and entrapment). The level one variables were centred at the individual level (i.e., group mean centred). Level two data consisted of between-person variation in the background variables, which were assumed to be fixed; continuous level two variables (i.e. childhood trauma and attachment anxiety/avoidance) were entered into the models grand mean centred, and dichotomous level two variables (i.e. age) were uncentred. Important for testing the study hypotheses, this multilevel modelling approach allowed for the examination of whether within-person variables, and slopes, were moderated by the between-person, level two variables.

The data in HLM were analysed in a number of different blocks. Firstly, whether childhood trauma had any cross-level (main) effects on daily defeat, entrapment and stress was examined, as well as whether the within-persons stress-defeat and stress-entrapment slopes were moderated by childhood trauma. Second, whether attachment anxiety or avoidance had cross-level (main) effects on daily defeat, entrapment and stress, and whether the within-persons stress-defeat and stress-entrapment slopes were moderated by attachment anxiety or avoidance, was examined.

Third, investigation of whether the cross-level (main) effects of childhood trauma on daily defeat, stress and entrapment were moderated by attachment anxiety or avoidance was carried out. Finally, whether the cross-level (main) effect of childhood trauma on the stress-defeat and stress-entrapment slopes were moderated by attachment anxiety or avoidance, was explored. Cross-level interactions that were statistically significant were decomposed via plotting the interaction, as advised by Aiken & West (1991), using simple slopes (Preacher et al., 2006). Since age and gender were controlled for in all analyses in HLM, they were entered into the models as covariates; as advised by Simmons et al (2011), results are presented with and without adjustment for covariates.

3.0 Results

3.1 Descriptive Statistics

Descriptive statistics for the background and daily diary variables are provided in Table 4. Since hypotheses 1 and 2 were tested using the phase one data (N = 481) and hypotheses 3-6 testing using phase one and two data combined (N = 243), descriptive statistics are presented for both phases. Inspection of phase one data shows that half of the participants in the study had experienced suicidal ideation, and nearly one fifth had made a suicide attempt, within their lifetime. Participants' relationship-general attachment avoidance score, as averaged across the four key attachment relationships (mother, father, romantic partner and best friend), was higher than that for attachment anxiety.

Around half of the phase one participants continued to the second phase of the study. Table 4 indicates that generally, participants who continued to the second study phase had experienced slightly less trauma, were more securely attached (i.e., less attachment anxiety and avoidance) and reported slightly lower levels of suicidality. Inspection of the phase two averages would suggest that participants felt, on average, more defeated than trapped, daily. Characteristics of the sample are discussed further in Section 4.1 and are compared with normative data to determine representativeness.

Table 4

Descriptive statistics (means and standard deviations) for variables used in phase one (N = 481) and phase two (N = 243) analyses

Variable	*Mean*	*SD*
Phase one (N = 481) [a]		
Total CTQ score	43.52	17.69
Attachment anxiety	2.58	1.32
Attachment avoidance	3.25	1.11
Suicidal ideation history (%)	1.50 (50.10)	0.50
Suicide attempt history (%)	1.18 (18.30)	0.30
Phase two (N = 243)		
Total CTQ score	41.03	16.07
Attachment anxiety	2.44	1.28
Attachment avoidance	3.10	1.07
Suicidal ideation history (%)	1.44 (44)	0.50
Suicide attempt history (%)	1.14 (14)	0.34
Daily defeat [b]	2.22	1.24
Daily entrapment [b]	1.93	1.22
Daily stress [b]	10.14	3.72

Note: Non-transformed, non-mean-centred values are presented.
[a] Data for phase two participants are also included in phase one reporting.
[b] Level one variables administered daily. Means are the average daily participant score.

3.2 Hypothesis 1

Higher levels of childhood trauma, attachment anxiety and attachment avoidance will be associated with a greater history of suicidality (suicidal ideation and attempts).

3.2.1 Correlations Between Childhood Trauma, Attachment Anxiety, Attachment Avoidance, and Suicide History.

Initial correlations presented in Table 5 show that all background variables were significantly correlated with a history of suicide ideation and attempts ($p < .001$). The greater the individual's level of childhood trauma, attachment anxiety and attachment avoidance, the more likely they were to have experienced suicidal ideation or suicide attempts, in the past.

Table 5

Correlations between background study variables (N = 481)

Variable	Childhood Trauma	Attachment Avoidance	Attachment Anxiety	Suicidal Ideation	Suicide Attempts
Age	*.171***	*.190***	*.051*	*.007*	*.103**
Gender	*.175***	*.104**	*.201***	*.095**	*.112**
Attachment Avoidance	*.709***				
Attachment Anxiety	*.673***	*.703***			
Suicidal ideation	*.413***	*.345***	*.405***		
Suicide attempts	*.415***	*.350***	*.364***	*.365***	

Note: Correlations involving two continuous variables (attachment anxiety and avoidance, childhood trauma, age) used two-tailed Pearson's product moment correlation. All other correlations used two-tailed Point-Biserial correlation.

* $p < .05$. *** $p < .001$.

Table 5 also highlights that several of the key study variables were associated with age and gender, providing a clear rationale for the need to control for these variables in analyses.

3.2.2 Hierarchical Linear and Hierarchical Logistic Regression Analyses

Childhood trauma predicting attachment anxiety and avoidance

Two hierarchical linear regression analyses were carried out to determine the effects of age, gender and childhood trauma in predicting both attachment anxiety and avoidance (Table 6). For both regressions there was independence of residuals, as assessed by a Durbin-Watson statistic of 1.902 for attachment anxiety and 1.986 for attachment avoidance. There was homoscedasticity, as assessed by visual inspection of plots of studentized residuals versus unstandardized predicted values. Finally, there was no evidence of multicollinearity, as assessed by tolerance values greater than 0.1.

Table 6

Hierarchical regression analyses testing the effects of childhood trauma on attachment avoidance and anxiety, whilst controlling for age and gender (n = 467)

		β Step 1	β Step 2	ΔR^2 for step	Total R^2
	Attachment anxiety				
Step 1	Age	.002	-.001	.063***	
	Gender [a]	.136***	.063***		
Step 2	Childhood trauma		.916***	.406***	.470
	Attachment avoidance				
Step 1	Age	.018***	.006*	.049***	
	Gender [a]	.262*	-.126		
Step 2	Childhood trauma		4.891***	.464***	.513

Note. [a] 1 = males, 2 = females
*** = $p < .001$, * = $p < .05$

For childhood trauma predicting attachment anxiety, at step 1 age and gender significantly entered the equation, $F(1, 464) = 15.688$, $p < .001$, explaining 6.3% of the variation. At step 2, the addition of childhood trauma, $F(1, 463) = 354.884$, $p < .001$, significantly explained an additional 40.6% of the variation, so that participants with greater levels of childhood trauma reported greater attachment anxiety.

For childhood trauma predicting attachment avoidance, the same hierarchical process was used, which firstly saw age and gender significantly enter the equation, $F(1, 464) = 11.961$, $p < .001$, explaining 4.9% of the variance. The addition of childhood trauma, $F(1, 463) = 441.579$, $p < .001$, explained an additional 46.4% of the variation in attachment avoidance, so that participants with greater levels of childhood trauma reported greater attachment avoidance.

Childhood trauma predicting history of suicidality

Hierarchical logistic regressions were performed to ascertain the effects of age, gender and childhood trauma on the likelihood of having experienced a history of suicidal ideation or suicide attempts (Table 7). For each hierarchical logistic regression analysis, linearity of the continuous

variables with respect to the logit of the dependent variable was assessed via the Box Tidwell (1962) procedure. A Bonferroni correction was applied using all terms in the regression model. Based on this assessment, for each of the regression models now presented, all continuous independent variables were found to be linearly related to the logit of the dependent variable.

The first regression in Table 7 looks at predicting history of suicide ideation. Age and gender were entered into the first model, which was not statistically significant, $\chi^2(2) = 1.055$, $p = .590$, with age and gender alone predicting only 0.3% (Nagelkerke R^2) of the variance in suicide ideation history. In model 2, childhood trauma was added to the regression, making the model statistically significant, $\chi^2(3) = 81.44$, $p < .001$, and accounting for 21.3% (R^2) of the suicide ideation variance.

The second regression in Table 7 looked at predicting a history of suicide attempts. Age and gender were entered into the first model, which was statistically significant, $\chi^2(2) = 13.577$, $p = .001$, showing that age and gender alone predicted 4.7% (R^2) of the variance in suicide attempt history. However when childhood trauma was added to the regression in model two, 25% (R^2) of the variance in history of suicide ideation was accounted for, $\chi^2(3) = 77.591$, $p < .001$.

Table 7

Logistic regression predicting likelihood of suicide history variables based on age, gender and childhood trauma (n = 467)

		β	SE	Wald	*df*	*p*	Odds Ratio	95% CI for Odds Ratio	
Suicide ideation								Lower	Upper
Model 1	Age	.003	0.007	0.212	1	.646	1.003	0.989	1.018
	Gender [a]	.224	0.232	0.929	1	.335	1.251	0.793	1.973
Model 2	Age	-.012	0.008	2.263	1	.133	0.988	0.972	1.004
	Gender [a]	-.229	0.253	0.819	1	.366	0.795	0.484	1.307
	Childhood trauma	.058	0.007	60.642	1	**<.001**	1.059	1.044	1.075
Suicide attempt									
Model 1	Age	.023	0.009	6.922	1	**.009**	1.023	1.006	1.041
	Gender [a]	1.000	0.378	6.996	1	**.008**	2.719	1.296	5.706
Model 2	Age	.007	0.010	0.517	1	.472	1.007	0.987	1.028
	Gender [a]	.473	0.401	1.392	1	.238	1.604	0.987	3.518
	Childhood trauma	.055	0.007	54.067	1	**<.001**	1.056	1.041	1.072

Note. CI = Confidence Interval
[a] 1 = males, 2 = females

Attachment anxiety predicting history of suicidality

Further hierarchical logistic regressions were performed to ascertain the effects of age, gender and attachment anxiety on the likelihood of having experienced a history of suicidal ideation or suicide attempts (Table 8). For each hierarchical logistic regression analysis, linearity of the continuous variables with respect to the logit of the dependent variable was assessed via the Box Tidwell (1962) procedure. A Bonferroni correction was applied using all terms in the regression model. Based on this assessment, for each of the regression models now presented, all continuous independent variables were found to be linearly related to the logit of the dependent variable.

The first regression in Table 8 looked at predicting a history of suicide ideation. Age and gender were entered into the first model, which was not statistically significant, $\chi^2(2) = 1.055$, $p = .590$, showing that age and gender alone predicted only 0.3% (R^2) of the variance in suicide ideation history. In model 2, attachment anxiety was added to the regression, making the model statistically significant, $\chi^2(3) = 81.179$, $p < .001$, and accounting for 21.3% (R^2) of the variance in history of suicide ideation.

The second regression in Table 8 looked at predicting a history of suicide attempts. Age and gender were entered into the first model, which was statistically significant, $\chi^2(2) = 13.577$, $p = .001$, showing that age and gender alone predicted 4.7% (R^2) of the variance in suicide attempt history. However when attachment anxiety was added to the regression in model 2, 22.6% (R^2) of the variance in history of suicide attempts was accounted for, $\chi^2(3) = 69.575$, $p < .001$.

Table 8

Logistic regression predicting likelihood of suicide history variables based on age, gender and attachment anxiety (n = 467)

		β	SE	Wald	*df*	*p*	Odds Ratio	95% CI for Odds Ratio	
Suicide ideation								Lower	Upper
Model 1	Age	.003	0.007	0.212	1	.646	1.003	0.989	1.018
	Gender [a]	.224	0.232	0.929	1	.335	1.251	0.793	1.973
Model 2	Age	-.004	0.008	0.249	1	.618	0.996	0.981	1.012
	Gender [a]	-.346	0.255	1.844	1	.174	0.707	0.429	1.166
	Attachment anxiety	.744	0.094	62.620	1	**.000**	2.105	1.750	2.530
Suicide attempts									
Model 1	Age	.023	0.009	6.922	1	**.009**	1.023	1.006	1.041
	Gender [a]	1.00	0.378	6.996	1	**.008**	2.719	1.296	5.706
Model 2	Age	.019	0.010	3.864	1	.049	1.019	1.000	1.038
	Gender [a]	.340	0.401	0.719	1	.397	1.405	0.640	3.086
	Attachment anxiety	.696	0.099	49.090	1	**.000**	2.005	1.651	2.436

Note. CI = Confidence Interval
[a] 1 = males, 2 = females

Attachment avoidance predicting history of suicidality

Finally, hierarchical logistic regressions were performed to ascertain the effects of age, gender and attachment avoidance on the likelihood of having experienced a history of suicidal ideation or suicide attempts (Table 9). For each hierarchical logistic regression analysis, linearity of the continuous variables with respect to the logit of the dependent variable was assessed via the Box Tidwell (1962) procedure. A Bonferroni correction was applied using all terms in the regression model. Based on this assessment, for each of the regression models now presented, all continuous independent variables were found to be linearly related to the logit of the dependent variable.

The first regression in Table 9 looked at predicting a history of suicide ideation. Age and gender were entered into the first model, which was not statistically significant, $\chi^2(2) = 1.055$, $p = .590$, showing that age and gender alone predicted only 0.3% (R^2) of the variance in suicide ideation history. In model 2, attachment avoidance was added to the regression, making the model

statistically significant, $\chi^2(3) = 60.439$, $p < .001$, and accounting for 16.2% (R^2) of the variance in history of suicide ideation.

The second regression in Table 9 looked at predicting a history of suicide attempts. Age and gender were entered into the first model, which was statistically significant, $\chi^2(2) = 13.577$, $p = .001$, showing that age and gender alone predicted 4.7% (R^2) of the variance in suicide attempt history. However when attachment avoidance was added to the regression in model 2, 20.6% (R^2) of the variance in history of suicide attempts was accounted for, $\chi^2(3) = 63.016$, $p < .001$.

Table 9

Logistic regression predicting likelihood of suicide history variables based on age, gender and attachment avoidance (n = 467)

		β	SE	Wald	*df*	*p*	Odds Ratio	95% CI for Odds Ratio	
Suicide ideation								Lower	Upper
Model 1	Age	.003	0.007	0.212	1	.646	1.003	0.989	1.018
	Gender [a]	.224	0.232	0.929	1	.335	1.251	0.793	1.973
Model 2	Age	-.010	0.008	1.480	1	.224	0.990	0.975	1.006
	Gender [a]	.056	0.245	0.052	1	.819	1.058	0.654	1.711
	Attachment avoidance	.711	0.100	50.984	1	**.000**	2.037	1.676	2.476
Suicide attempts									
Model 1	Age	.023	0.009	6.922	1	**.009**	1.023	1.006	1.041
	Gender [a]	1.000	0.378	6.996	1	**.008**	2.719	1.296	5.706
Model 2	Age	.010	0.010	0.958	1	.328	1.010	0.991	1.029
	Gender [a]	.753	0.392	3.698	1	.055	2.124	0.985	4.581
	Attachment avoidance	.835	0.130	41.357	1	**.000**	2.304	1.786	2.971

Note. CI = Confidence Interval
[a] 1 = males, 2 = females

In summary, childhood trauma, attachment anxiety and attachment avoidance significantly predicted a history of suicidal ideation and suicide attempts, over and above age and gender.

3.3 Hypothesis 2

The effects of childhood trauma on history of suicidality will be stronger in those scoring higher in attachment anxiety and avoidance (i.e. moderated by attachment)

To test the hypothesis that attachment anxiety and avoidance moderate the relationship between childhood trauma and suicidality, a series of hierarchical logistic regressions were conducted. In each analysis, childhood trauma was added in the first step, the attachment variable was added second, and the interaction term between childhood trauma and the attachment variable was added in the final step. For the adjusted analyses, an additional first step saw age and gender added to the model. Tables 10 and 11 report on the role of attachment avoidance in moderating the relationship between childhood trauma and a history of suicide ideation, and suicide attempts, respectively.

Firstly, Table 10 highlights a significant interaction between childhood trauma and attachment avoidance (unadjusted, β Coeff = -0.014, p = .032; adjusted, β Coeff = -0.015, p = .025) predicting suicide ideation, with and without controlling for age and gender. To explore this significant interaction, the effects of childhood trauma on suicide ideation were explored separately in individuals who scored high and low in attachment avoidance. The adjusted data set was split into participants scoring lower than the median attachment avoidance score (n = 231), and those scoring at the median score or higher (n = 236). Regression analyses performed separately on each of these groups showed that the strength and significance of the relationship between childhood trauma and history of suicide ideation was similar across both high, p = <.001, OR = 1.040, 95% CI [1.020, 1.061], and low, p = <.001, OR = 1.073, 95% CI [1.036, 1.112], levels of attachment avoidance.

Further to this, there was no significant interaction between childhood trauma and attachment avoidance for predicting a history of suicide attempts (see Table 11).

Table 10

Hierarchical logistic regression testing the interactive effects of childhood trauma and attachment avoidance on history of suicide ideation.

		Unadjusted (n = 481)									Adjusted (n = 467)							
		β	SE	Wald	*df*	*p*	Odds Ratios	95% CI for odds ratios			*β*	SE	Wald	*df*	*p*	Odds Ratio	95% CI for Odds Ratios	
Step								Lower	Upper	**Step**							Lower	Upper
	Age	__	__	__	__	__	__	__	__	1	-.014	0.008	2.762	1	.097	0.986	0.970	1.002
	Gender [a]	__	__	__	__	__	__	__	__		-.146	0.260	0.314	1	.575	0.865	0.520	1.438
1	Childhood trauma	.049	0.010	25.483	1	**<.001**	1.050	1.030	1.070	2	.053	0.010	27.028	1	**.000**	1.055	1.034	1.076
2	Attachment avoidance	.223	0.129	3.008	1	.083	1.250	0.971	1.608	3	.228	0.132	2.979	1	.084	1.256	0.970	1.626
3	Childhood trauma x attachment avoidance	-.014	0.006	4.614	1	**.032**	0.986	0.974	0.999	4	-.015	0.007	5.022	1	**.025**	0.985	0.972	0.998

Note. CI = Confidence Interval

[a] 1 = males, 2 = females

Table 11

Hierarchical logistic regression testing the interactive effects of childhood trauma and attachment avoidance on history of suicide attempts.

		Unadjusted (n = 481)									Adjusted (n = 467)							
		β	SE	Wald	*df*	*p*	Odds Ratios	95% CI for Odds Ratios			*β*	SE	Wald	*df*	*p*	Odds Ratio	95% CI for Odds Ratios	
Step								Lower	Upper	**Step**							Lower	Upper
	Age	__	__	__	_	__	__	__	__	1	.005	0.010	0.219	1	.640	1.005	0.985	1.025
	Gender [a]	__	__	__	_	__	__	__	__		.516	0.407	1.606	1	.205	1.676	0.754	3.723
1	Childhood trauma	.050	0.010	23.357	1	**.000**	1.051	1.030	1.072	2	.052	0.011	23.224	1	**.000**	1.053	1.031	1.076
2	Attachment avoidance	.505	0.163	9.641	1	**.002**	1.656	1.205	2.278	3	.469	0.166	8.015	1	**.005**	1.599	1.155	2.213
3	Childhood trauma x attachment avoidance	-.011	0.007	2.280	1	.131	0.989	0.975	1.003	4	-.140	0.007	3.417	1	.065	0.986	0.972	1.001

Note. CI = Confidence Interval

[a] 1 = males, 2 = females

Next, Tables 12 and 13 report on the role of attachment anxiety as a moderator of the relationship between childhood trauma and a history of suicide ideation, and suicide attempts, respectively.

Table 12 highlights a significant interaction between childhood trauma and attachment anxiety predicting suicide ideation, with and without controlling for age and gender (unadjusted, β Coeff = -0.010, p = .041; adjusted, β Coeff = -0.011, p = .036). To explore this significant interaction, the effects of childhood trauma on suicide ideation were explored separately in individuals who scored high and low in attachment anxiety. The adjusted data set was split into participants scoring lower than the median attachment anxiety score (n = 225), and those scoring at the median score or higher (n = 242). Regression analyses performed on each of the groups showed that the strength and significance of the relationship between childhood trauma and suicide ideation history was similar for both the high anxiety, p < .001, OR = 1.044, 95% CT [1.025, 1.065], and low anxiety, p = 001, OR = 1.047, 95% CI [1.019, 1.076], groups.

As can be seen from Table 13, attachment anxiety significantly moderated the relationship between childhood trauma and history of suicide attempts when covariates were not entered into the model, however the interaction attenuated and became non-significant with covariates entered, and thus the interaction was not decomposed.

Table 12

Hierarchical logistic regression testing the interactive effects of childhood trauma and attachment anxiety on history of suicide ideation.

		Unadjusted (n = 481)									Adjusted (n = 467)							
		β	SE	Wald	*df*	*p*	Odds Ratios	95% CI for Odds Ratios			*β*	SE	Wald	*df*	*p*	Odds Ratio	95% CI for Odds Ratios	
Step								Lower	Upper	**Step**							Lower	Upper
	Age	—	—	—	—	—	—	—	—	1	-.012	0.008	1.925	1	.165	0.988	0.972	1.005
	Gender [a]	—	—	—	—	—	—	—	—		-.433	0.266	2.779	1	.096	0.642	0.381	1.081
1	Childhood trauma	.034	0.008	16.596	1	**.000**	1.035	1.018	1.052	2	.038	0.009	18.079	1	**.000**	1.038	1.020	1.057
2	Attachment anxiety	.480	0.111	18.822	1	**.000**	1.616	1.301	2.007	3	.515	0.116	19.855	1	**.000**	1.674	1.334	2.100
3	Childhood trauma x attachment anxiety	-.010	0.005	4.162	1	**.041**	0.990	0.981	1.000	4	-.011	0.005	4.406	1	**.036**	0.989	0.980	0.999

Note. CI = Confidence Interval

[a] 1 = males, 2 = females

Table 13

Hierarchical logistic regression testing the interactive effects of childhood trauma and attachment anxiety on history of suicide attempt

		Unadjusted (n = 481)								Adjusted (n = 467)							
		β	SE	Wald	*df*	*p*	Odds Ratios	95% CI for Odds Ratios			*β*	SE	Wald	*df*	*p*	Odds Ratio	95% CI for Odds Ratios
Step								Lower	Upper	**Step**							Lower Upper
	Age	—	—	—	—	—	—	—	—	1	.009	0.010	0.738	1	.390	1.009	0.989 1.030
	Gender [a]	—	—	—	—	—	—	—	—		.189	0.415	0.206	1	.650	1.208	0.535 2.725
1	Childhood trauma	.045	0.009	24.916	1	**.000**	1.046	1.028	1.064	2	.044	0.009	22.062	1	**.000**	1.045	1.026 1.064
2	Attachment anxiety	.563	0.133	17.968	1	**.000**	1.756	1.354	2.279	3	.537	0.139	14.946	1	**.000**	1.711	1.303 2.247
3	Childhood trauma x attachment anxiety	-.011	0.005	4.221	1	**.040**	0.989	0.979	1.000	4	-.010	0.005	3.663	1	.056	0.990	0.980 1.000

Note. CI = Confidence Interval
[a] 1 = males, 2 = females

To summarise, both attachment anxiety and avoidance moderated the relationship between childhood trauma and suicidal ideation. However, the strength of the childhood trauma-suicide ideation relationship remained similar at both high and low levels of the attachment variables. Further to this, there was no evidence to suggest that either of the attachment scales moderated the relationship between childhood trauma and a history of suicide attempts.

3.4 Hypothesis 3

Higher levels of childhood trauma will be associated with higher levels of daily defeat, entrapment and stress, and childhood trauma levels will moderate the stress-defeat and stress-entrapment slopes.

Multilevel modelling was used to explore whether childhood trauma had a significant effect on daily defeat, entrapment and stress and whether the stress-entrapment or stress-defeat slopes were moderated by childhood trauma.

Firstly, there was a significant main effect (β_{01}) of childhood trauma on daily defeat, entrapment and stress, such that higher scores on the CTQ were associated with higher levels of self-reported defeat, entrapment and stress, at the daily level (see Table 14); significance remained when controlling for age and gender.

Table 14

Main effects of childhood trauma on daily stress, defeat and entrapment

		Unadjusted (n = 243)				Adjusted for covariates (n = 239)		
Variable		Coeff	SE	*p*		Coeff	SE	*p*
Defeat								
Intercept	β_{00}	2.227	0.056	**< .001**	β_{00}	2.001	0.288	**<.001**
Childhood trauma	β_{01}	1.419	0.395	**< .001**	β_{01}	1.556	0.382	**<.001**
Gender [a]	—	—	—	—	β_{02}	0.121	0.152	.427
Age	—	—	—	—	β_{03}	-0.012	0.005	**.008**
Entrapment								
Intercept	β_{00}	1.958	0.059	**<.001**	β_{00}	2.003	0.304	**<.001**
Childhood trauma	β_{01}	2.419	0.402	**<.001**	β_{01}	2.451	0.414	**<.001**
Gender [a]	—	—	—	—	β_{02}	-0.030	0.160	.853
Age	—	—	—	—	β_{03}	-0.003	0.005	.523
Stress								
Intercept	β_{00}	10.195	0.189	**<.001**	β_{00}	8.899	0.920	**<.001**
Childhood trauma	β_{01}	6.612	1.350	**<.001**	β_{01}	6.836	1.348	**<.001**
Gender [a]	—	—	—	—	β_{02}	0.707	0.496	.155
Age	—	—	—	—	β_{03}	-0.044	0.016	**.006**

Note. β = hierarchical multivariate linear modelling symbol; Coeff = standard coefficient
[a] 1 = males, 2 = females

Next, inspection of Table 15 shows that childhood trauma did not moderate the daily stress-defeat slope. However, it did significantly moderate the daily stress-entrapment slope (β_{11}) (unadjusted; Coeff = 0.185 , p = .030; adjusted, Coeff = 0.182 p = .033). The adjusted cross-level interaction was decomposed using simple slopes procedures developed by Preacher et al (n.d, 2006) for MLM and using Preacher's calculator (Preacher et al., 2006). The strength of the stress-entrapment slope was assessed at low (mean – 1SD), medium (mean) and high (mean + 1SD) levels of childhood trauma (see Figure 2). Results showed that the stress-entrapment slope was significant (p < .001) at all three levels of childhood trauma. Therefore, whilst the significant interaction demonstrated a difference in the strength of the stress-entrapment slope depending on the amount of childhood trauma, the simple slopes procedure revealed that each of the slopes were statistically significant. However, it is worth noting that the highest levels of entrapment were observed on high stress days in individuals with high levels of childhood trauma.

Table 15

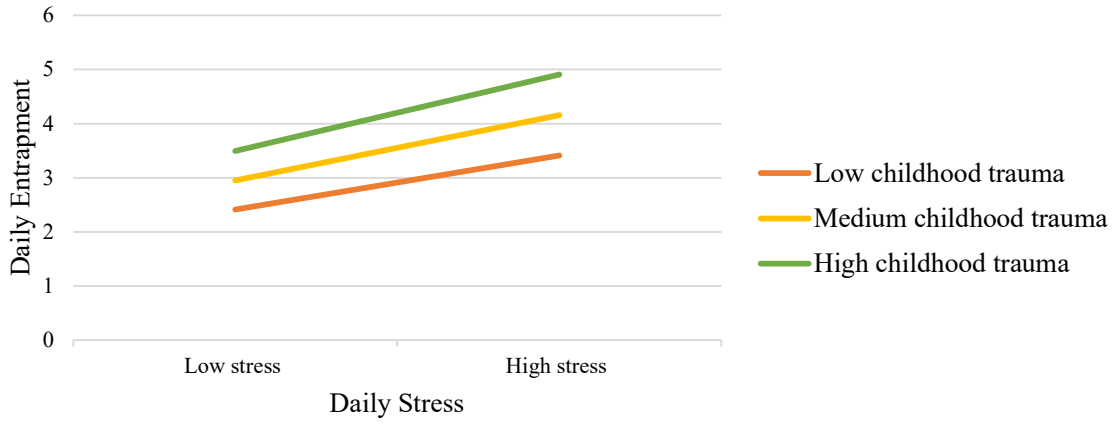
Stress-defeat and stress-entrapment slopes, as moderated by childhood trauma

		Unadjusted (n = 243)				Adjusted for covariates (n = 239)		
Variable		Coeff	SE	*p*		Coeff	SE	*p*
Stress-defeat slope								
Intercept	β_{00}	2.226	0.056	**<.001**	β_{00}	2.121	0.265	**<.001**
Childhood trauma	β_{01}	1.419	0.393	**<.001**	β_{01}	1.543	0.386	**<.001**
Gender [a]	—	—	—	—	β_{02}	0.054	0.139	.696
Age	—	—	—	—	β_{03}	-0.010	0.005	.036
Stress-defeat slope	β_{10}	0.244	0.013	**<.001**	β_{10}	0.244	0.013	**<.001**
Childhood trauma x stress-defeat slope	β_{11}	0.052	0.086	.546	β_{11}	0.045	0.087	.607
Stress-entrapment slope								
Intercept	β_{00}	1.958	0.059	**<.001**	β_{00}	2.156	0.276	**<.001**
Childhood trauma	β_{01}	2.417	0.401	**<.001**	β_{01}	2.431	0.416	**<.001**
Gender [a]	—	—	—	—	β_{02}	-0.115	0.145	.429
Age	—	—	—	—	β_{03}	0.000	0.005	.968
Stress-entrapment slope	β_{10}	0.169	0.012	**<.001**	β_{10}	0.162	0.012	**<.001**
Childhood trauma x stress-entrapment slope	β_{11}	0.185	0.085	**.030**	β_{11}	0.182	0.085	**.033**

Note. β = hierarchical multivariate linear modelling symbol; Coeff = standard coefficient
[a] 1 = males, 2 = females

Figure 2.

The moderating effect of childhood trauma on the daily stress-entrapment slope



3.5 Hypothesis 4

Higher levels of attachment anxiety and avoidance will be associated with high levels of daily defeat, entrapment and stress, and attachment anxiety and avoidance levels will moderate the stress-defeat and stress-entrapment slopes.

Main effects of attachment anxiety on daily risk factors and as a moderator of the daily slopes

As shown in Table 16, there was a significant main effect (β_{01}) of attachment anxiety on all daily suicide risk factors, such that higher levels of attachment anxiety were associated with higher levels of self-reported defeat, entrapment and stress, at the daily level. This significance remained when controlling for age and gender.

Inspection of Table 17 shows that attachment anxiety did not significantly moderate the stress-defeat relationship (β_{11}). Attachment anxiety did, however, significantly moderate the daily stress-entrapment slope (β_{11}) (unadjusted; Coeff = 0.187 , p = <.001; adjusted, Coeff = 0.176 p = .001). However, the simple slopes analyses showed that the slopes were not significant at low (p = .476), medium (p = .335), or high (p = .226) levels of attachment anxiety. Therefore, whilst the significant interaction demonstrated a difference in the strength of the stress-entrapment slope depending on levels of attachment anxiety, the simple slopes procedure failed to reveal this difference.

Table 16

Main effects of attachment anxiety on daily stress, defeat and entrapment

		Unadjusted (n = 243)				Adjusted for covariates (n = 239)		
Variable		Coeff	SE	*p*		Coeff	SE	*p*
Defeat								
Intercept	β_{00}	2.228	0.053	**< .001**	β_{00}	2.566	0.188	**<.001**
Attachment anxiety	β_{01}	1.590	0.243	**<.001**	β_{01}	1.613	0.243	**<.001**
Gender [a]	—	—	—	—	β_{02}	-0.011	0.146	.941
Age	—	—	—	—	β_{03}	-0.011	0.004	**.012**
Entrapment								
Intercept	β_{00}	1.957	0.056	**<.001**	β_{00}	1.947	0.150	**<.001**
Attachment anxiety	β_{01}	2.001	0.259	**<.001**	β_{01}	2.078	0.270	**<.001**
Gender [a]	—	—	—	—	β_{02}	-0.158	0.151	.298
Age	—	—	—	—	β_{03}	0.000	0.004	.991
Stress								
Intercept	β_{00}	10.19	0.177	**<.001**	β_{00}	11.32	0.452	**<.001**
Attachment anxiety	β_{01}	6.337	0.847	**<.001**	β_{01}	6.237	0.857	**<.001**
Gender [a]	—	—	—	—	β_{02}	0.279	0.459	.544
Age	—	—	—	—	β_{03}	-0.034	0.014	**.013**

Note. β = hierarchical multivariate linear modelling symbol; Coeff = standard coefficient
[a] 1 = males, 2 = females

Table 17

Stress-defeat and stress-entrapment slopes, as moderated by attachment anxiety

		Unadjusted (n = 243)				Adjusted for covariates (n = 239)		
Variable		Coeff	SE	*p*		Coeff	SE	*p*
Stress-defeat slope								
Intercept	β_{00}	2.227	0.053	**<.001**	β_{00}	2.347	0.259	**<.001**
Attachment anxiety	β_{01}	1.604	0.242	**<.001**	β_{01}	1.655	0.245	**<.001**
Gender [a]	—	—	—	—	β_{02}	-0.071	0.136	.604
Age	—	—	—	—	β_{03}	-0.008	0.004	**.046**
Stress-defeat slope	β_{10}	0.244	0.013	**<.001**	β_{10}	0.244	0.013	**<.001**
Attachment anxiety x stress-defeat slope	β_{11}	0.086	.056	.127	β_{11}	0.081	0.057	.159
Stress-entrapment slope								
Intercept	β_{00}	1.958	0.056	**<.001**	β_{00}	2.357	0.265	**<.001**
Attachment anxiety	β_{01}	2.011	0.259	**<.001**	β_{01}	2.115	0.270	**<.001**
Gender [a]	—	—	—	—	β_{02}	-0.225	0.138	.105
Age	—	—	—	—	β_{03}	0.003	0.004	.521
Stress-entrapment slope	β_{10}	0.165	0.012	**<.001**	β_{10}	0.162	0.012	**<.001**
Attachment anxiety x stress-entrapment slope	β_{11}	0.187	0.054	**<.001**	β_{11}	0.176	0.053	**.001**

Note. β = hierarchical multivariate linear modelling symbol; Coeff = standard coefficient
[a] 1 = males, 2 = females

Main effects of attachment avoidance on daily risk factors and as a moderator of the daily slopes

Similarly, as shown in Table 18, there was a significant main effect (β_{01}) of attachment avoidance on daily defeat, entrapment and stress, such that higher levels of attachment avoidance were associated with higher levels of self-reported daily defeat, entrapment and stress. Significance remained when controlling for age and gender.

Like childhood trauma and attachment anxiety, Table 19 shows that attachment avoidance also significantly moderated the daily stress-entrapment slope (β_{11}) (unadjusted; Coeff = 0.025 , p = .021; adjusted, Coeff = 0.024 p = .031), but not the stress-defeat slope. The simple slopes analyses showed that the stress-entrapment slope was significant ($p < .001$) at all three levels of attachment avoidance (see Figure 3). Therefore, whilst the significant interaction demonstrated a difference in the strength of the stress-entrapment slope depending on the amount of attachment avoidance, the simple slopes procedure revealed that each of the slopes were statistically significant. However, it is worth noting that the highest levels of entrapment were observed on high stress days, in individuals with high levels of attachment avoidance.

Table 18

Main effects of attachment avoidance daily stress, defeat and entrapment

		Unadjusted (n = 243)				Adjusted for covariates (n = 239)		
Variable		Coeff	SE	*p*		Coeff	SE	*p*
Defeat								
Intercept	β_{00}	2.228	0.054	**< .001**	β_{00}	2.662	0.145	**<.001**
Attachment avoidance	β_{01}	0.269	0.053	**<.001**	β_{01}	0.300	0.048	**<.001**
Gender [a]		—	—	—	—	β_{02} 0.198	0.151	.190
Age		—	—	—	—	β_{03} -0.014	0.004	**.002**
Entrapment								
Intercept	β_{00}	1.958	0.057	**<.001**	β_{00}	2.086	0.163	**<.001**
Attachment avoidance	β_{01}	0.402	0.055	**<.001**	β_{01}	0.409	0.054	**<.001**
Gender [a]		—	—	—	—	β_{02} 0.106	0.155	.496
Age		—	—	—	—	β_{03} -0.004	0.005	.385
Stress								
Intercept	β_{00}	10.190	0.186	**<.001**	β_{00}	11.691	0.494	**<.001**
Attachment avoidance	β_{01}	1.054	0.180	**<.001**	β_{01}	1.150	0.166	**<.001**
Gender [a]		—	—	—	—	β_{02} 1.084	0.479	**.025**
Age		—	—	—	—	β_{03} -0.047	0.015	**.002**

Note. β = hierarchical multivariate linear modelling symbol; Coeff = standard coefficient
[a] 1 = males, 2 = females

Table 19

Stress-defeat and stress-entrapment slopes, as moderated by attachment avoidance

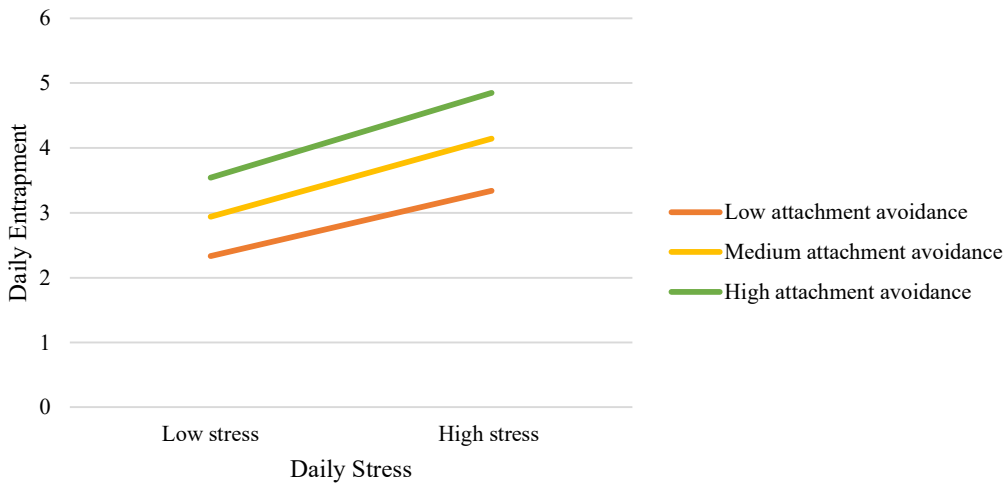
		Unadjusted (n = 243)				Adjusted for covariates (n = 239)		
Variable		Coeff	SE	*p*		Coeff	SE	*p*
Stress-defeat slope								
Intercept	β_{00}	2.227	0.054	**<.001**	β_{00}	1.981	0.263	**<.001**
Attachment avoidance	β_{01}	0.270	0.052	**<.001**	β_{01}	0.296	0.049	**<.001**
Gender [a]	—	—	—	—	β_{02}	0.132	0.139	.341
Age	—	—	—	—	β_{03}	-0.011	0.004	**.011**
Stress-defeat slope	β_{10}	0.245	0.013	**<.001**	β_{10}	0.245	0.013	**<.001**
Attachment avoidance x stress-defeat slope	β_{11}	0.008	0.012	.523	β_{11}	0.007	0.012	.592
Stress-entrapment								
Intercept	β_{00}	1.958	0.057	**<.001**	β_{00}	1.933	0.270	**<.001**
Attachment avoidance	β_{01}	0.404	0.055	**<.001**	β_{01}	0.403	0.056	**<.001**
Gender [a]	—	—	—	—	β_{02}	0.009	0.143	.948
Age	—	—	—	—	β_{03}	-0.001	0.005	.833
Stress-entrapment slope	β_{10}	0.166	0.012	**<.001**	β_{10}	0.162	0.012	**<.001**
Attachment avoidance x stress-entrapment slope	β_{11}	0.025	0.011	**.021**	β_{11}	0.024	0.011	**.031**

Note. β = hierarchical multivariate linear modelling symbol; Coeff = standard coefficient

[a] 1 = males, 2 = females

Figure 3

The moderating effect of attachment avoidance on the daily stress-entrapment slope



To conclude, greater levels of both attachment-related anxiety and avoidance were associated with higher levels of defeat, entrapment and stress. Both attachment patterns also moderated the stress-entrapment slope, but not the stress-defeat slope.

3.6 Hypothesis 5

The effects of childhood trauma on the daily risk factors for suicide will be stronger in individuals who score higher on the attachment subscales compared to those who score lower.

Next, we explored whether the relationship between childhood trauma and the daily risk factors for suicide were moderated by participants' levels of attachment anxiety. In these models, we tested whether the level two interaction between attachment anxiety and trauma, influenced daily defeat, entrapment and stress. In each analysis, childhood trauma was added in the first step, the attachment variable was added second, and the interaction term between childhood trauma and the attachment variable was added in the final step. For the adjusted analyses, an additional first step saw age and gender added to the model. Inspection of Table 20 shows that there was no significant interaction between childhood trauma and attachment anxiety influencing levels of daily defeat, entrapment, or stress (β_{05}). This was the case in the unadjusted and adjusted analyses.

The same analysis was carried out to explore whether attachment avoidance moderated the relationship between childhood trauma and the daily risk factors. Again, there was no significant interaction between childhood trauma and attachment avoidance influencing daily defeat, entrapment and stress (β_{05}) (see Table 21). This was the case in the unadjusted and adjusted analyses.

To conclude, the effects of childhood trauma on the daily risk factors for suicide were not stronger in those who scored higher in attachment anxiety or avoidance.

Table 20

Association between childhood trauma and daily stress, defeat and entrapment, as moderated by attachment anxiety

		Unadjusted (n = 243)				Adjusted for covariates (n = 239)		
Variable		Coeff	SE	*p*		Coeff	SE	*p*
Defeat								
Intercept	β_{00}	2.228	0.053	**<.001**	β_{00}	2.237	0.276	**<.001**
Gender [a]	β_{01}	—	—	—	β_{01}	-0.009	0.146	.952
Age	β_{02}	—	—	—	β_{02}	-0.011	0.004	**.017**
Childhood trauma	β_{03}	-0.332	0.468	.479	β_{03}	-0.056	0.480	.908
Attachment anxiety	β_{04}	1.741	0.337	**<.001**	β_{04}	1.638	0.356	**<.001**
Childhood trauma x attachment anxiety	β_{05}	-0.471	1.725	.785	β_{05}	-0.259	1.731	.881
Entrapment								
Intercept	β_{00}	1.957	0.056	**<.001**	β_{00}	2.260	0.287	**<.001**
Gender [a]	β_{01}	—	—	—	β_{01}	-0.002	0.151	.256
Age	β_{02}	—	—	—	β_{02}	-0.002	0.005	.757
Childhood trauma	β_{03}	0.725	0.508	.155	β_{03}	0.699	0.544	.200
Attachment anxiety	β_{04}	1.668	0.364	**<.001**	β_{04}	1.761	0.393	**<.001**
Childhood trauma x attachment anxiety	β_{05}	0.827	1.744	.636	β_{05}	0.947	1.780	.595
Stress								
Intercept	β_{00}	10.196	0.178	**<.001**	β_{00}	9.727	0.085	**<.001**
Gender [a]	β_{01}	—	—	—	β_{01}	0.250	0.461	.588
Age	β_{02}	—	—	—	β_{02}	-0.031	0.015	**.011**
Childhood Trauma	β_{03}	0.365	1.665	.827	β_{03}	1.162	1.719	.500
Attachment anxiety	β_{04}	6.176	1.164	**<.001**	β_{04}	5.717	1.221	**<.001**
Childhood trauma x attachment anxiety	β_{05}	1.849	5.922	.755	β_{05}	2.531	5.973	.672

Note. β = hierarchical multivariate linear modelling symbol; Coeff = standard coefficient
[a] 1 = males, 2 = females

Table 21

Association between childhood trauma and daily stress, defeat and entrapment, as moderated by attachment avoidance

		Unadjusted (n = 243)				Adjusted for covariates (n = 239)		
Variable		Coeff	SE	*p*		Coeff	SE	*p*
Defeat								
Intercept	β_{00}	2.228	0 .054	**<.001**	β_{00}	1.890	0.280	**<.001**
Gender [a]	—	—	—	—	β_{01}	0.185	0.148	.212
Age	—	—	—	—	β_{02}	-0.014	0.005	**.002**
Childhood trauma	β_{03}	0.208	0.522	.690	β_{03}	0.147	0.496	.768
Attachment avoidance	β_{04}	0.249	0.075	**.001**	β_{04}	0.313	0.536	.560
Childhood trauma x attachment avoidance	β_{05}	0.029	0.375	.939	β_{05}	0.039	0.357	.914
Entrapment								
Intercept	β_{00}	1.958	0.056	**<.001**	β_{00}	1.893	0.298	**<.001**
Gender [a]	—	—	—	—	β_{01}	0.031	0.158	.843
Age	—	—	—	—	β_{02}	-0.005	0.005	.302
Childhood trauma	β_{03}	0.812	0.505	.109	β_{03}	0.737	0.510	.150
Attachment avoidance	β_{04}	0.327	0.077	**<.001**	β_{04}	0.344	0.077	**<.001**
Childhood trauma x attachment avoidance	β_{05}	0.296	0.416	.477	β_{05}	0.332	0.422	.432
Stress								
Intercept	β_{00}	10.196	0.185	**<.001**	β_{00}	8.542	0.900	**<.001**
Gender [a]	—	—	—	—	β_{01}	0.905	0.486	.064
Age	—	—	—	—	β_{02}	-0.050	0.016	**.002**
Childhood trauma	β_{03}	2.750	1.974	.165	β_{03}	2.098	1.887	.267
Attachment avoidance	β_{04}	0.790	0.272	**.004**	β_{04}	0.958	0.252	**<.001**
Childhood trauma x attachment avoidance	β_{05}	0.480	1.292	.711	β_{05}	0.456	1.216	.708

Note. β = hierarchical multivariate linear modelling symbol; Coeff = standard coefficient
[a] 1 = males, 2 = females

3.7 Hypothesis 6

The effects of childhood trauma on daily stress-defeat and stress-entrapment slopes will be stronger in individuals who score higher in attachment anxiety and avoidance compared to those who score lower.

Finally, we investigated whether the level two interaction between childhood trauma and attachment anxiety or avoidance, influenced the within-person, daily stress-entrapment, or daily stress-defeat slopes.

Inspection of Table 22 shows that the level two interaction (β_{13}) between childhood trauma and attachment anxiety did not moderate either the stress-entrapment or stress-defeat slope. Similarly, Table 23 shows that the interaction (β_{13}) between childhood trauma and attachment avoidance also did not moderate either slope.

To conclude, the effects of childhood trauma on the daily stress-defeat and stress-entrapment slopes were not moderated by either attachment pattern.

Table 22

Association between childhood trauma and the daily stress-defeat and stress-entrapment slopes, as moderated by attachment anxiety.

		Unadjusted (n = 243)				Adjusted for covariates (n = 239)		
Variable		Coeff	SE	*p*		Coeff	SE	*p*
Stress-defeat slope								
Intercept	β_{00}	2.227	.053	**<.001**	β_{00}	2.350	.257	**<.001**
Gender [a]	—	—	—	—	β_{01}	-0.072	.135	.592
Age	—	—	—	—	β_{02}	-0.008	.005	.064
Stress-defeat slope	β_{10}	0.244	.013	**<.001**	β_{10}	0.244	.013	**<.001**
Childhood trauma	β_{11}	-0.017	.113	.884	β_{11}	-0.027	.114	.809
Attachment anxiety	β_{12}	0.091	.074	.219	β_{12}	0.094	.075	.210
Childhood trauma x attachment anxiety	β_{13}	-0.683	.387	.079	β_{13}	-0.607	.388	.119
Stress-entrapment slope								
Intercept	β_{00}	1.958	.056	**<.001**	β_{00}	2.386	.265	**<.001**
Gender [a]	—	—	—	—	β_{01}	-0.241	.138	.082
Age	—	—	—	—	β_{02}	0.001	.005	.759
Stress-entrapment slope	β_{10}	0.165	.012	**<.001**	β_{10}	0.161	.012	**<.001**
Childhood trauma	β_{11}	0.013	.115	.906	β_{11}	0.032	.115	.783
Attachment anxiety	β_{12}	0.179	.076	**.018**	β_{12}	0.162	.074	**.031**
Childhood trauma x attachment anxiety	β_{13}	-0.343	.388	.378	β_{13}	-0.343	.391	.381

Note. β = hierarchical multivariate linear modelling symbol; Coeff = standard coefficient
[a] 1 = males, 2 = females

Table 23

Association between childhood trauma and the daily stress-defeat and stress-entrapment slopes, as moderated by attachment avoidance.

		Unadjusted (n = 243)				Adjusted for covariates (n = 239)		
Variable		Coeff	SE	*p*		Coeff	SE	*p*
Stress-defeat slope								
Intercept	β_{00}	2.227	.054	**<.001**	β_{00}	2.010	.258	**<.001**
Gender [a]	—	—	—	—	β_{01}	0.116	.136	.393
Age	—	—	—	—	β_{02}	-0.012	.005	**.011**
Stress-defeat slope	β_{10}	0.245	.013	**<.001**	β_{10}	0.245	.013	**<.001**
Childhood trauma	β_{11}	0.100	.110	.367	β_{11}	0.094	.112	.400
Attachment avoidance	β_{12}	-0.003	.016	.854	β_{12}	-0.003	.016	.854
Childhood trauma x attachment avoidance	β_{13}	-0.145	.081	.076	β_{13}	-0.135	.082	.100
Stress-entrapment slope								
Intercept	β_{00}	1.959	.056	**<.001**	β_{00}	2.053	.276	**<.001**
Gender [a]	—	—	—	—	β_{01}	-0.057	.145	.688
Age	—	—	—	—	β_{02}	-0.002	.005	.653
Stress-entrapment slope	β_{10}	0.166	.012	**<.001**	β_{10}	0.162	.012	**<.001**
Childhood trauma	β_{11}	0.172	.110	.118	β_{11}	0.179	.111	.108
Attachment avoidance	β_{12}	0.008	.015	.757	β_{12}	0.007	.015	.652
Childhood trauma x attachment avoidance	β_{13}	-0.135	.079	.207	β_{13}	-0.096	.082	.239

Note. β = hierarchical multivariate linear modelling symbol; Coeff = standard coefficient
[a] 1 = males, 2 = females

3.8 Summary of Main Findings

The study showed robust evidence in support of hypothesis one; those with higher levels of childhood trauma, attachment anxiety and attachment avoidance were more likely to have experienced suicidal ideation or suicide attempts in the past. In partial support of hypothesis two, the study found that attachment anxiety and avoidance significantly moderated the relationship between childhood trauma, and, specifically, suicidal ideation. Decomposition of these significant interactions however, showed that the effect of childhood trauma on suicide ideation was significant at both low and high levels of attachment anxiety and avoidance. It was also expected that

attachment anxiety and avoidance would moderate the childhood trauma-suicide *attempt* relationship, however, there was no evidence in support of this.

The study highlighted significant associations between childhood trauma and daily risk factors for suicide (stress, defeat and entrapment); as levels of childhood trauma increased, self-reported daily stress, defeat and entrapment also increased. The same was found with the attachment scales; as attachment anxiety and avoidance increased, levels of all three daily risk factors for suicide also increased. However, the findings were only in partial support of hypotheses three and four, since childhood trauma, attachment anxiety and attachment avoidance were all found to moderate the daily stress-entrapment slope, yet not the daily stress-defeat slope. Decomposition of the significant interactions for the stress-entrapment slope failed to provide information about how the strength of this slope changed depending on the levels of childhood trauma and attachment.

Finally, and contrary to prediction, there was no evidence in support of hypotheses five or six; the effects of childhood trauma on the daily risk factors and the daily slopes, were not moderated by attachment anxiety or avoidance. The key findings will be explored in greater detail in the discussion chapter.

4.0 Discussion

This final chapter will begin by briefly discussing the characteristics of the study sample, followed by a summary of the key findings that emerged. Then, it will explore each key finding in turn, in the context of the current literature. Next, the clinical implications of the study, along with strengths and limitations will be outlined, and finally suggestions for future research will be proposed.

4.1 Sample Characteristics

The characteristics of the current phase one and two samples were compared to norms identified in other research samples and the general population to determine representativeness. Beginning with lifetime prevalence of suicidality, 50% of the phase one sample had experienced suicidal ideation, and 18% had made a suicide attempt; prevalence of both was slightly lower in the phase two sample. Considering estimates for lifetime prevalence in the general population stand at 9% and just under 3%, for suicidal ideation and attempts respectively (Nock et al., 2008), this suggests that the current samples had experienced considerably higher levels of suicidality than typical general population estimates.

This theme extends to childhood trauma; Scher et al (2001) identified an average total CTQ score of 31.8 in a community sample, considerably lower than the current sample means of 43.50 and 41.03 for phases one and two respectively. The means are, in fact, akin to that of a 'suicide ideation' group of a recent study (O'Connor et al., 2020), which observed a similar mean of 43.37. This observation is reasonable considering the current sample showed high levels of past suicidality, which, as discussed, is strongly connected to childhood trauma (Angelakis, Gillespie, & Panagioti, 2019). As for attachment, in a large, community data set, relationship-general attachment anxiety and avoidance scores were 1.7 and 2.6 respectively (Fraley et al., 2006). Again, values in the present study are considerably greater than this, although they follow the same pattern with levels of avoidance being greater than anxiety.

To consider the daily diary variables, the current sample means of 1.93 for entrapment and 2.22 for defeat are very similar to those identified in the aforementioned study's 'suicide ideation' group (O'Connor et al., 2020), for which the entrapment and defeat means were observed at 1.99 and 2.12, respectively. With regards to stress, normative sample data for the brief PSS in the general population cites a mean of 6.1 (Warttig et al., 2013), which again, is considerably lower than the daily mean for the current sample of 10.1, suggesting participants in the current study experienced considerably more stress, daily, than the typical general population. In summary, participants in

both phases of the current study scored more negatively on all study variables than other community samples, with means comparable to populations who have experienced suicide ideation.

Finally, it is also important to note that over three quarters of the sample were female in both phases, however, this gender difference is comparable to similar suicide risk studies (Czyz et al., 2019; O'Connor et al., 2020; Stagaki et al., 2022) and will be discussed in the limitations section (see Section 4.6.3). With regards to ethnicity, 86.3% of the phase one sample, and 89.3% of the phase two sample were White, which is representative of the UK population (Office for National Statistics, 2011).

4.2 Main Findings

4.2.1 Associations Between Childhood Trauma, Attachment, and Suicidality

The current study found that those with higher levels of childhood trauma were more likely to have experienced suicide ideation or having made a suicide attempt, in the past. It also found that higher childhood trauma levels were associated with increased attachment anxiety and avoidance scores. These robust findings are congruent with published literature which has demonstrated links between experiencing trauma during childhood, and both risk of suicide in adulthood (Felitti et al., 1988; Miniati et al., 2017; Wang et al., 2022; Zortea et al., 2019), as well as developing maladaptive attachment patterns (Erozkan, 2016). Additionally, and also consistent with previous studies (Grunebaum et al., 2010; Riggs & Jacobvitz, 2002), the findings highlighted how less secure attachment (i.e., higher in anxiety and avoidance) increased the likelihood of having experienced suicidality.

Whilst much of the literature thus far has focussed on understanding links between childhood trauma, attachment, and suicide risk, in clinical populations (Miniati et al., 2017), such as those receiving treatment in mental health inpatient wards, this study provides strong evidence in support of these relationships being found in individuals located in the general population. Importantly, the findings are in accordance with the IMV model previously discussed (O'Connor, 2011; O'Connor & Kirtley, 2018) and support the notion that trauma during childhood, as well as having a less secure attachment pattern, are underlying vulnerabilities which appear to place someone at a greater risk of suicide. The IMV model does not predict whether background variables such as these may be more influential in the steps leading to suicide ideation (motivational phase), or to suicide attempts (volitional phase). However, the very nature of background variables is that they form an

underlying susceptibility which increases the likelihood for later risk and therefore, as is supported by the study findings, one would assume that that they would be important in forming the foundations for both suicide ideation *and* attempts.

Due to the cross-sectional design employed to investigate these associations, it is important to note that directionality between the variables of interest cannot be commented on. Also, because suicide was rated over the course of the lifetime, we cannot know when it occurred in relation to childhood trauma, or to the development of attachment patterns. For example, whilst it is assumed that a maladaptive attachment pattern proceeds suicidal experiences, the current study is unable to determine this. Whilst the same issue exists for the link between childhood trauma and suicidality, it may be more reasonably assumed, with childhood trauma occurring in early life, that the experience of trauma will have temporally preceded suicidality in the current sample. However, longitudinal studies following participants over longer periods of time are required to determine the precise nature of these relationships.

To extend the findings further, it would be fruitful for research to examine whether individuals high in both attachment avoidance *and* anxiety are at an even greater risk of suicidality. As mentioned, according to the traditional prototypical attachment classifications, a combination of both high attachment anxiety *and* avoidance may be indicative of a '*disorganised* or *'fearful'* attachment (Bartholomew & Horowitz, 1991). Given this attachment type is understood to develop from trauma, particularly when experienced in relation to the main attachment figure (Main & Solomon, 1986), this would be a useful avenue for research to explore.

4.2.2 The Relationship Between Childhood Trauma and Suicidality as Moderated by Attachment

Research investigating the role of attachment in suicide research tends to explore it as a mediating variable, and to the author's knowledge, no studies to date have investigated it as a moderator of the childhood trauma-suicidality relationship, in the general population. Smith et al (2012) investigated attachment as a moderator in the relationship between social maladjustment domains, and suicidality, specifically in participants with a known trauma history. However, as discussed previously, trauma was not included as a variable in the analysis, and so attachment was not directly explored as a moderator of the childhood trauma-suicide relationship. Further to this, the study was in a niche population of women who had specifically been victims of sexual abuse in childhood, and so the findings lacked generalisability. Investigating whether attachment anxiety or avoidance

strengthened or weakened the relationship between childhood trauma and suicidality in the current sample therefore aimed to provide valuable information about attachment as a potential buffer in the relationship, as well as to understand how attachment is best placed in the current suicide models.

It was anticipated that the strength of the childhood trauma-suicidality relationship would be greater in individuals with higher levels of attachment anxiety and avoidance. The findings showed that the relationship between childhood trauma and, specifically, suicide ideation, was significantly moderated by both attachment anxiety and avoidance. However, decomposition of the two interactions revealed that the trauma-suicide ideation relationship remained significant for both 'high' and 'low' levels of the attachment variables.

One possible explanation is the issue of multicollinearity between the interacting variables, which may have contributed to the difficulty in interpreting the interactions, given that childhood trauma was highly correlated to both attachment anxiety, and avoidance (r = .673 and r = 709, respectively). Whilst the study used mean centred variables, which are recommended to reduce multicollinearity in regressions with higher order terms (Aiken & West, 1991), other opinion is that high correlations between interacting variables when testing for moderation is not a cause for concern (Disatnik & Sivan, 2016; McClelland et al., 2017). Either way, the interactions themselves were not highly significant (p = .025 and p = .036), and so require replication.

Whilst it is of interest that the attachment scales only moderated the relationship between childhood trauma and suicide ideation, but not between childhood trauma and suicide *attempts*, it is important to understand why this might have been the case. One tentative explanation for this finding might be that the study had low power to detect a significant interaction when predicting suicide attempts, since only 18% (n = 88) had attempted suicide, yet 50% (n = 241) had experienced suicide ideation. One could speculate that an interaction effect may have been easier to find when predicting suicide ideation. Nevertheless, what is clear from these results is that the interaction between childhood trauma and attachment, in predicting suicidal ideation, is more complex than originally thought. Therefore, these results should be treated with caution until they are replicated.

The findings discussed thus far have been cross-sectional in nature and based on participants' recall of suicidal thoughts and behaviours over the course of their lifetime. They provide additional support for the existing evidence base, demonstrating associations between trauma, attachment, and suicide risk, however, they cannot determine temporality of the associations. With suicide risk known to fluctuate over short time periods (Kleiman et al., 2017), the daily diary component of this study, used to collect information about proximal risk factors daily, was a novel extension of the

literature. The following analyses allow more precise conclusions to be drawn about the route via which childhood trauma and attachment may influence suicidality.

4.2.3 Associations Between Attachment and Daily Risk Factors for Suicide

In the IMV model (see Figure 1), 'motivational phase' factors are theorised to interact with background variables in the 'pre-motivational phase' of suicide (O'Connor, 2011; O'Connor & Kirtley, 2018) and empirical support for such pathways is developing. Due to previous research supporting the role of defeat, entrapment and stress as important proximal suicide risk factors (Höller et al., 2020; O'Connor, et al., 2020; O'Connor & Portzky, 2018), it was predicted that greater levels of attachment anxiety and avoidance, would be associated with greater levels of these factors, on a daily basis. This hypothesis was supported by the current findings which will now be discussed, starting with the relationship between attachment and daily stress.

The findings show that both anxious and avoidance attachments are associated with greater perceived stress, on a day-to-day basis. These results are consistent with previous studies which highlight links between insecure attachments and higher perceived stress, both cross-sectionally and longitudinally (Bottonari et al., 2007; Maunder et al., 2006; Pierrehumbert et al., 2009). There is an extensive literature in support of unresponsive parenting, which is associated with children developing a less secure attachment style, leading to a dysregulated stress response (Kidd et al., 2011). Moreover, since cortisol levels in babies are socially regulated, when a caregiver is inattentive, the baby cannot self-regulate and consequently experiences a spike in cortisol levels (Gunnar & Donzella, 2002). High levels of stress during early years of life can be detrimental to stress-management in later years (Gerhardt, 2004), which has been supported via the measurement of cortisol levels (Pierrehumbert et al., 2009). In terms of understanding why this happens, it is reasonable to assume that insecurely attached individuals (i.e., scoring higher in attachment anxiety or avoidance), may feel less able to reach out for support, or may not be confident in the reliability of others to help when stressors arise and, therefore, will experience stress more acutely on a day-to-day basis (Gerhardt, 2004). It has been suggested that stress may be experienced differently for those who are anxiously attached, compared to those more avoidant. For example, avoidant individuals may generate interpersonal stress due to their fear of being close to others, whereas individuals scoring high in anxiety may experience stress associated with interpersonal conflict (Bottonari et al., 2007); these possibilities ought to be investigated in future research. Contrary to our findings, some research has not identified a relationship between attachment avoidance and subjective stress (Maunder et al., 2006), which may be considered consistent with Attachment

Theory, in so far as avoidantly attached individuals being less likely to report stress due to a tendency to minimise and supress their feelings (Golding, 2008).

Another point of note is that research has shown that females with 'unresolved trauma', a hallmark of the '*disorganised'* attachment category previously introduced, exhibit the highest levels of perceived stress compared to women with other attachment orientations (Pierrehumbert et al., 2009). As discussed, individuals considered to have disorganised attachment are likely to score more highly in both attachment anxiety *and* avoidance (Bartholomew & Horowitz, 1991). With the predominantly female sample in the current study, the significant associations between both attachment anxiety and avoidance, and daily stress, may therefore be explained by a high proportion of individuals falling into the more traditional classification of 'disorganised' attachment, scoring highly in both attachment anxiety *and* avoidance on the ECR-RS. However, this cannot be reliably deduced from the current results and, as mentioned previously, the findings would benefit from being explored in individuals high in both attachment avoidance *and* anxiety.

The current study also found strong associations between attachment and daily defeat and entrapment. Despite theoretical literature suggesting that poorer attachment will impact how able someone is to cope when faced with setbacks and defeats in life (Sloman et al., 2003), and may foster a strong motivation to escape (Fischer-Mamblona, 2000), empirical support to back this is lacking, with limited research carried out to test such theories. Some research has investigated self-defeating patterns (Wei & Ku, 2007; Williams & Schill, 1994) in the context of insecure attachments, however such patterns are considered more of a personality type, rather than defined as a perception of failed struggle, as was the case in this study. Cuenca (2013) and Zortea et al (2020) highlight the association between insecure attachment and both defeat and entrapment, in both students and the general population, however the two studies measured these constructs cross-sectionally. Therefore, the findings of the current study offer a novel extension of the literature by highlighting this association when measuring defeat and entrapment daily. With the study findings in support of the hypothesis that more anxious and avoidantly attached people experience greater stress, defeat and entrapment daily, this provides empirical support for existing theories (Fischer-Mamblona, 2000; Sloman et al., 2003), builds on existing suicide models, and suggests that fostering more secure attachments may be a way to reduce suicide risk, which will be discussed later in this chapter.

In summary, with a secure attachment (i.e. less anxious and avoidant) considered to offer greater resiliency and capacity to cope with distress (Green et al., 2020), it follows that more insecurely attached people find it harder to manage when stressors arise, feeling more defeated and trapped if they do not feel able to rely on their relationships for support.

4.2.4 Associations Between Childhood Trauma and Daily Risk Factors for Suicide

Another key finding of the study was that greater levels of childhood trauma were associated with greater levels of daily stress, defeat and entrapment. To first consider stress, previous research studies have consistently shown that individuals who have experienced childhood trauma exhibit blunted cortisol reactivity, that is, releasing less cortisol in response to daily stressors than individuals who have not experienced childhood trauma (Gartland et al., 2014; Lovallo, 2013; O'Connor et al., 2018; O'Connor, et al., 2020). This is suggestive of biological changes in response to childhood trauma, perhaps similar to those that may occur when insecure attachments develop, which see the stress response become dysregulated. Conversely, however, individuals who have experienced trauma report greater levels of *perceived* stress when completing subjective stress measures, both cross-sectionally and when measured longitudinally (Bossé et al., 2018; Mc Elroy & Hevey, 2014), suggesting that despite the blunted response physiologically, this does not dampen the lived experience of stress. The current study findings are consistent with this and suggest that childhood trauma may increase suicide risk via stress. As previously discussed, the IMV model posits that stress, or stressful life events, are a background factor interacting with other vulnerabilities to form the basis for suicidal behaviours in the pre-motivational phase. The association between stress and the background variables in this study supports this notion.

Whilst a wealth of evidence supports the role of defeat and entrapment as risk factors for suicide (Branley-Bell et al., 2019; O'Connor & Portzky, 2018), literature assessing whether childhood trauma is associated with both factors is scarce, with some evidence that childhood trauma specifically affects *social* defeat, the feeling of being isolated of from the majority (Seo & Choi, 2018). An important finding of the current study, and extension of the literature, is therefore that childhood trauma is indeed associated with daily levels of defeat and entrapment.

Interestingly, a meta-analysis has confirmed that post-traumatic stress disorder (PTSD), which can stem from childhood trauma, is associated with feelings of defeat and entrapment (Siddaway et al., 2015). Further to this Panagioti et al (2012) found that in victims of trauma who also had PTSD, entrapment was significantly higher than trauma victims without PTSD. This may suggest that childhood trauma impacts experiences of defeat and entrapment via PTSD.

In summary, the findings showing that childhood trauma and attachment are associated with the daily risk factors support the IMV model and extend the existing research literature; suggesting that long-term negative impacts of trauma during childhood may be observed on a daily basis, often many decades later. The associations involving defeat and entrapment are particularly interesting,

with little research investigating these factors alongside background factors. Whilst conclusions regarding causality cannot be drawn, the study does support the notion that background variables temporally precede the day-to-day experience of risk factors.

4.2.5 Moderators of the Stress-Entrapment and Stress-Defeat Slopes

Due to research showing that stress appears to affect suicide risk via increasing feelings of defeat and entrapment (O'Connor et al., 2020; O'Connor, 2003), the current study looked to investigate the impact of childhood trauma and attachment on the daily risk factors as within-person slopes, so that these potentially meaningful associations were not lost.

Considering first the stress-entrapment slope; as was hypothesised, childhood trauma, attachment anxiety and attachment avoidance were all found to be significant moderators of this relationship. However, decomposition of these interactions using simple slopes (Preacher et al., 2006) did not aid interpretation. When decompositions were carried out for childhood trauma and attachment anxiety as moderators of the stress-entrapment slope, the slope was significant at both low, medium and high levels of the moderator. Whereas, decomposition of attachment avoidance as the moderator showed that the stress-entrapment slopes at low, medium and high level of avoidance were not significant. In other words, the significant interactions here highlighted that there was a difference in the strength of the slopes depending on levels of each moderating variable, but the subsequent simple slopes analysis failed to reveal these differences. Second to this, neither childhood trauma, attachment anxiety, or attachment avoidance moderated the *stress-defeat* slope.

A number of explanations may be hypothesised to explain these findings. Firstly, it is important to consider measurement error which, when present in the individual predictors used to generate an interaction term, greatly reduces the reliability of the interaction term generated (Aiken & West, 1991). It has also been suggested that cases where simple slopes analyses fail to be informative, such as this, can often be a result of the presence of strong main effects for the independent variables in the analysis (Jaccard et al., 1990). In this instance, all moderating variables were significantly associated with daily stress, defeat and entrapment; therefore, this explanation is plausible. Finally, it is recommended that for simple slopes analyses, as with the median split method, the slope should be tested at levels of the moderating variable that make theoretical sense and that previous research studies have employed (Aiken & West, 1991), to test specific conditional

relationships. However, no known previous literature has advised on values of attachment anxiety or avoidance at which to test the slopes.

4.2.6 The Relationship Between Childhood Trauma and Daily Risk Factors for Suicide, as Moderated by Attachment

To extend the hypothesis that attachment would moderate the relationship between childhood trauma and a history of suicidality, the final two hypotheses of the study investigated this on a daily level. It was hypothesised that attachment anxiety and avoidance would both moderate the relationship between childhood trauma and the suicide risk factors (stress, defeat, entrapment) as measured daily, as well as the stress-entrapment and stress-defeat slopes. However, the findings provided no support for these hypotheses.

As outlined by Jaccard et al (1990), and discussed already, there are a number of reasons why true interaction effects may go undetected or be difficult to interpret, such as low statistical power, multicollinearity and measurement error of the variables. Additionally, as previous research has shown (Lyons-Ruth et al., 2015; Restrepo et al., 2016; Touati et al., 2021), it may be the case that attachment plays a mediating role in these relationships tested, as opposed to moderating. That is, it may be that childhood trauma impacts attachment security which, in turn, impacts suicidality. However, it is important to consider that the findings may be correctly indicating that there were no significant interactions. Nevertheless, future research ought to investigate these relationships further using similar designs before firm conclusions can be drawn.

4.3 Impact of Covid-19

With this research being completed during the Covid-19 global pandemic, and with data collection taking place whilst government-imposed restrictions were in effect, it is important consider the potential impact of the pandemic on the study with respect to the wellbeing of participants, as well as the general management of the research. Although participants did not complete the study during a period of national or local ‘lockdown’, where the public were advised to cease non-essential contact and travel (The Crown Prosecution Service, 2021), restrictions such as limits on household gatherings along with continued uncertainty about the pandemic, were still in effect during the recruitment period (Institute of Goverment Analysis, 2021). The negative psychological impact

associated with experiencing a global pandemic, and how this may have impacted participant responses to the research measures in this study, will be considered.

A longitudinal analysis of mental health and wellbeing found that suicide ideation significantly increased over time during the first national lockdown in March 2020 (O'Connor et al., 2021), yet interestingly, levels of perceived defeat and entrapment decreased over the same study period. However, this may be explained by the defeat and entrapment measures tapping into past experiences, as opposed to concerns regarding the future (O'Connor et al., 2021). Either way, this research highlights that the current study sample may have been experiencing greater levels of suicidality in response to the pandemic. Whilst the recruitment strategy specifically sought out individuals who had been feeling low, experiences of suicidality in the current sample were higher than anticipated and may reflect the impact of the pandemic on mental health. It is also important to note that the pandemic had, and continues to have, a disproportionate impact on marginalised groups (O'Connor et al., 2022). For example, people with disabilities (Sayce, 2021) and from minority ethnic backgrounds (Home of Commons, 2020) experienced a greater toll on their mental health as the pandemic saw existing health inequalities exacerbated (O'Connor et al., 2020). Despite this, although to varying degrees, the pandemic was a phenomenon experienced by all participants in the current study.

Since both phases of the research were conducted remotely, the method of data collection did not require adaptation in response to the pandemic. However, the efficacy of the recruitment methods used are likely to have been impacted, for example, posters displayed are likely to have received less attention due to decreased footfall in public spaces. Although it is not possible to determine the routes via which participants were made aware of the study, it is likely that the majority were informed of the study via online advertisements. To summarise, whilst Covid-19 may have negatively impacted the participants' wellbeing for the worse, recruitment rate did not appear to be adversely impacted by the pandemic.

4.4 Clinical Implications

Improving our understanding of suicide risk factors is crucial in generating accurate theories, risk assessments and treatment plans for vulnerable individuals, yet our ability to accurately predict suicide has not improved over recent decades (Franklin et al., 2016). The main study findings of childhood trauma and attachment being associated with past suicidality, as well as daily stress, defeat and entrapment, have implications for suicide theory, assessment and intervention; each of these areas will therefore be discussed in turn, beginning with suicide theory.

The findings highlight that along with childhood trauma, attachment is an important pre-motivational phase 'background' factor within the IMV model (O'Connor, 2011; O'Connor & Kirtley, 2018) increasing the likelihood that someone will have experienced suicidality in the past, and making them more likely to experience proximal risk factors at present. Despite inconclusive findings, the results suggest that attachment anxiety and avoidance may strengthen the relationship between childhood trauma and a history of suicide ideation, suggesting that adult attachment is an important risk factor to bear in mind, specifically when an individual has already disclosed a traumatic childhood. These findings, along with the positive associations between both background factors and defeat and entrapment (motivational phase factors) are suggestive of childhood trauma and attachment being influential in the pathway to suicide ideation, as is proposed by the IMV model.

A multitude of suicide risk assessments are in use across the National Health Service (NHS); in fact, a recent national study identified 156 risk tools being used across 85 NHS mental health services (Graney et al., 2020). They found a lack of consistency in how the assessments were used, with clinicians expressing low confidence in how to manage a suicide crisis with a patient. Therefore, it is clear that assessment of suicide risk requires development, with suggestions of moving away from checklist completion, towards a person-centred approach (Graney et al., 2020). Indeed, the current study findings suggest that taking a holistic approach to suicide risk assessment, asking about environmental factors such as childhood trauma and assessing attachment patterns, alongside day-to-day proximal factors that increase immediate vulnerability, may help to identify those at risk, ahead of a suicide crisis. Risk assessments tend to focus on immediate susceptibility to suicide (Beck et al., 1988; Posner et al., 2011), that is, asking questions in relation to current risk such as plans of suicide and access to lethal methods. However, by moving towards preventative assessment where factors that lay the foundation for suicide, such as trauma and attachment, are monitored, risk may be detected sooner.

Lastly, how the findings inform interventions will be considered. The importance of trauma-informed care, along with interventions designed to help adults who have experienced childhood trauma, have been well documented in previous literature (see Meltono et al., 2020; NHS Highland, 2018). Therefore, with the findings showing greater attachment insecurity to increase the odds of having experienced suicidal thoughts or attempts 2-fold, as well as being significantly associated with daily risk factors, interventions aimed at improving insecure attachments will be focussed on. There is some evidence that psychological therapy can increase the security of attachment orientations (Taylor et al., 2015). Importantly, it has been suggested that the therapeutic relationship

formed between a patient and psychotherapist is, in fact, an important attachment relationship in of itself (Mallinckrodt, 2010). Through the therapist providing corrective emotional experiences, the patient may develop skills in building and maintaining healthy relationships (Mallinckrodt, 2010). Although attachment styles have shown to change over time (Girme et al., 2018), ideally an intervention would be delivered at a point when an individual's attachment patterns are most malleable, that is, during childhood. With the current study highlighting the importance of both trauma, and insecure attachments, one such therapy known as Dyadic Developmental Psychotherapy (DDP) targets both. Focussed on both the healing of developmental trauma, and promoting safety within current relationships, DDP involves a trained clinician, such as a clinical psychologist or psychotherapist, working alongside children or young people, and their families.

A final note on the implications of this study for interventions, is with respect to the scope for mental health support being delivered digitally. As demonstrated in this study, people in the general population at risk of suicide can be reached relatively easily online; given that the majority of people who die by suicide are not in contact with mental health services, digital interventions may therefore be an innovative way of reaching those who go undetected, yet are at risk.

4.5 Strengths of the Study

The study possesses a number of strengths. Firstly, there was a strong rationale for the research, with it being the first known study to look at attachment as a potential moderator of the childhood trauma-suicide relationship, in a non-clinical population. To reiterate, investigating pathways to suicide in the general population is essential given that the majority of suicides occur in individuals unknown to mental health services. Further to this, few studies investigate attachment as a mediating variable and virtually none investigate it as a potential moderator. This study therefore investigated a novel, under researched part of the suicide risk pathway, in an important population. In addition, by using the ECR-RS (Fraley et al., 2011) to generate continuous, relationship-general anxiety and avoidance scores, the current study shifted away from the somewhat outdated categorical approaches to attachment (Fraley & Waller, 1998).

Second, is the innovative daily diary methodology employed. Whilst suicide risk research frequently relies on cross-sectional findings, this study design allows conclusions to be drawn about the temporality of associations. By combining background data with repeated-measures data, this multi-level design allowed for the investigation of how daily risk factors for suicide change over time, within the individual, as a function of background risk factors. This research methodology also permitted the use of multilevel modelling. By accounting for the hierarchical nature of the level

one and level two variables in this study, this approach avoided inappropriately assuming that results at the population level apply to the individual level (Hamaker, 2013). A further positive of this statistical approach was that missing data points could be accounted for.

Finally, a relatively large sample size (N = 481) was obtained for research of this nature, with over 50% (N = 271) of participants progressing to the second, daily diary phase. This resulted in the analyses being sufficiently powered to detect a cross-level effect, based on an approach outlined by Murayama et al (2021). The successful recruitment is likely a result of the online nature of the study, which, although may have excluded a small number of adults without internet access (Office for National Statistics, 2019b), allowed the study to reach a large number of individuals. Delivering the study online also allowed the participants flexibility, allowing them to complete the phase one background measures, and respond to each daily diary, at a convenient time. The remote nature of the research also removed participant burden, such as the need to travel or meet the researchers face to face which was particularly pertinent in light of the Covid-19 pandemic. Finally, the study also demonstrated that accessing people with a range of childhood trauma histories and levels of suicide risks can be achieved, for the purpose of suicide research, without needing to recruit from clinical populations.

4.6 Limitations of the Study

The study findings must also be considered in light of several limitations. Broadly, these can be categorised into three areas: the measures adopted, the study design, and the sample recruited. Each area will be discussed in turn.

4.6.1 Study Measures

Firstly, there are several limitations acknowledged with regards to measuring childhood trauma. For most participants in the current sample, the trauma will have occurred many years ago, which introduces memory biases and inaccuracies, thus reducing the reliability of self-report measures such as the CTQ (Hardt & Rutter, 2004). In addition to this, it is thought that false negatives are more common than false positives when it comes to reporting past traumas, which may have resulted in the underreporting of childhood trauma in this study (Hardt & Rutter, 2004). Second, is the subjectivity of trauma. For example, items such as ‘I believe that I was emotionally abused’ presented from the CTQ are subject to differing interpretations, which could not be substantiated in

this research. Third, the CTQ does not capture *indirect* forms of childhood trauma, that is, traumatic experiences that impact a child via their environment, such as parental divorce, natural disasters, living in poverty, and systemic racism (NHS Highland, 2018). With research showing that these factors negatively impact attachment security (Crowell et al., 2009; Felitti et al., 1988; Murphy et al., 2014), the current study would have benefitted from using a measure which monitored a broader range of traumas. The Adverse Childhood Experiences (ACE) Questionnaire (Felitti et al., 1988) is also a self-report measure, yet differs from the CTQ in its incorporation of questions regarding indirect traumas that are likely to impact relationships, such as parental separation or imprisonment. The ACEs questionnaire therefore may have been better suited to this study, given the attachment focus of this research. Future replicative research should consider monitoring indirect, relational aspects of childhood trauma, particularly when researching it alongside attachment.

The ECR-RS attachment measure was adopted for this research because it was based on attachment as measured on a continuum, and since it allowed for the generation of relationship-general scores via averaging attachment anxiety and avoidance against different relational domains (as opposed to focussing solely on romantic relationships). However, literature continues to consider the Adult Attachment Interview (AAI; George et al., 1985) the gold-standard attachment measure, due to both its extensive use, and proven validity (Gander et al., 2017; Ravitz et al., 2010). Consisting of a face-to-face assessment with a trained professional, it is more detailed and potentially less biased than self-report measures such as the ECR-RS. However, due to its categorical classification system, which the current research was shifting away from, as well as it being reliant on the assessor being trained (Hesse, 2008), it was not suitable, nor feasible, for this research.

Finally, although single item defeat and entrapment measures were chosen to minimise participant burden, single item measures have been critiqued for not accurately measuring the construct intended (Liu & Miller, 2014). Employing a more detailed measure, such as the 8-item Short Defeat and Entrapment Scale (SDES; Griffiths et al., 2015), may have increased the validity of the findings. Further to this, with research highlighting that internal, but not external, entrapment predicts suicidal ideation longitudinally (Höller et al., 2022), it is important that more precise measures are employed to further unpick the associations found.

4.6.2 Study Design

Repeated, daily monitoring of symptoms can result in what is known as *assessment reactivity*; a phenomenon whereby through the process of monitoring symptoms, the symptoms themselves become altered (McCarthy et al., 2015; van Ballegooijen et al., 2016). This phenomenon has been illustrated in previous research (see Clifford & Davis, 2012; Kramer et al., 2014) and it may have been the case that when an individual's attention was drawn to their experience of defeat, stress and entrapment, they then engaged in self-correcting behaviours to attend to and reduce these negative experiences. A second type of reactivity is *response fatigue,* which again, daily diaries may be prone to due to the intense nature of repeat assessments, and is where the accuracy of the responses provided decreases over time (Reynolds et al., 2015). Whilst this study aimed to minimise this by keeping the daily diaries short, it is possible that, as the study progressed, participants did not pay adequate attention to the questions, and thus, provided less meaningful responses. However, it is worth noting that participants only completed one diary each day.

Whilst controlling for age and gender strengthened the robustness of the results, information on mental health diagnoses was not collected, and therefore not controlled for. Being diagnosed with mental health problems, in particular depression or PTSD are factors that highly correlate with suicide risk (Cai et al., 2021; Krysinska & Lester, 2010), and childhood trauma (Negele et al., 2015; Panagioti et al., 2012). Therefore, as is demonstrated by other suicide research (Massey et al., 2014; O'Connor et al., 2018; Zortea et al., 2020), the current study would have benefitted from controlling for mental health diagnosis in analyses. Further to this, given that being in a romantic relationship is associated with greater attachment security and stability (Scharfe & Cole, 2006), the study would have also benefitted from controlling for relationship status.

4.6.3 Study Sample

Final limitations of the study are with respect to the representativeness of the sample, given more than three quarters of the sample for both phases one and two, were female. Since males are three times more likely than women to die by suicide (Turecki et al., 2019), this limits the clinical relevance of the findings. Furthermore, due to adopting a non-random, opportunistic sampling strategy, the people who chose to participate may have possessed personal attributes that influenced the study variables, that were not controlled for. Whilst is has been highlighted that a small number of adults will not have been able to take part due to lack of internet access or technology literacy,

other groups excluded from the study were those who did not possess good understanding of written English, which again, may have reduced the representativeness of the study.

4.7 Recommendations for Future Research

As previously emphasised, replication of the study is important for several reasons. Most importantly, it would help to shed light on the significant interactions identified; specifically, how attachment anxiety and avoidance moderate the childhood trauma-suicide ideation relationship, as well as how they may moderate the stress-entrapment slope. Second, replication using a more representative sample is required, to draw inferences about the general population as well as establish whether the findings can be reliably generalised to other gender identities, particularly men. Third, controlling for relevant extraneous variables, specifically relationship status and presence of mental health diagnoses, would allow for more robust analysis. Finally, replication with the ACEs questionnaire (Felitti et al., 1988), which provides a broader assessment of childhood traumas - especially factors known to impact attachment formation and security, would be worthwhile.

The findings provide an extension to the attachment literature, which previously had not looked at the impact of attachment on suicide risk factors, daily. Whilst the current findings suggested that greater attachment anxiety and avoidance may strengthen the childhood trauma-suicide relationship, that is, have a moderating effect, previous research suggests it to be a mediator of this relationship. Research should therefore continue to consider attachment as both a mediator, and moderator, in the suicide pathway. In addition, since an estimated 40% of adults would be considered to have an insecure attachment orientation (Mickelson et al., 1997), yet only small percentage of these will ever go on to attempt suicide, key variables impacting this relationship should also be verified (Green et al., 2020).

Within the IMV model, investigating how attachment impacts and interacts with other motivational phase factors, such as hopelessness, thwarted belongingness and burdensomeness would create a more detailed and accurate understanding of how it may be best placed in the model. Although not preregistered as an aim of the current study, it would be fruitful to investigate whether some attachment relationships are more important than others. Identifying specific attachment relationships that moderate the childhood trauma-suicide relationship may helpfully narrow the focus for intervention.

More broadly, suicide research should continue to identify moderating variables in the childhood trauma-suicide relationship; potential buffers to the long-term damage imposed by trauma during childhood, which may be targeted clinically. By monitoring risk factors over prolonged periods, temporal and causal relationships between study variables may be established (Tucker et al., 2016). Ideally, a life span approach, where children are monitored through to adulthood would allow for conclusions regarding causality to be confirmed. However, with suicide research needing to examine complex relationships between suicide predictors (Franklin et al., 2016), there are suggestions of taking this one step further; with a growing interest in machine learning to detect a wide range of associations, amongst a great number of factors, algorithms to predict suicidality may be the next step for suicide research (Walsh et al., 2017).

4.8 Conclusions

The current research aimed to explore the role of attachment in the well-established relationship between childhood trauma and suicide risk and was the first study to investigate attachment as a moderating factor in this relationship, in the general population. Whilst both attachment anxiety and avoidance significantly moderated the childhood trauma-suicide ideation relationship, the nature of these interactions were unclear. Further to this, attachment did not moderate the relationship between childhood trauma and daily suicide risk factors. Further research is needed to understand and establish the potential moderating role of attachment, but this study offers a foundation for which future studies can work from.

The study also aimed to investigate associations between the background variables, and defeat, entrapment and stress, as experienced on a day-to-day basis. The daily diary methodology employed contributed findings that both strengthen and extend existing suicide literature. Namely, that experiencing childhood trauma and being more anxiously or avoidantly attached are associated with increased likelihood of having experienced thoughts of suicide, or having attempted suicide, in the past, as well as experiencing greater levels of defeat, entrapment and stress, daily.

Despite the limitations outlined, this study was the first to apply daily diary methodology to attachment research. The findings have important implications for informing suicide risk assessment, with respect to playing close attention to experiences of trauma and insecure attachments patterns, particularly if they should co-occur, as well as for targets for intervention. Theoretically, the findings add weight to the IMV model, but also suggest that attachment should be considered a key component of the suicide pathway. It is hoped that the study may act as a platform

for which future attachment research can develop, to better understand how core patterns of relating to others influence the complex pathway to suicide.

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Appendix A: Poster 1

Contribute to research and have the chance to win **£20 online shopping vouchers**

Clinical Psychology study interested in:

1) Childhood experiences
2) Relationships
3) Personality

For more information about mental health and where to get help, please visit:
www.mind.org.uk
https://www.samaritans.org/
Ethics approval: PSYC-270 18.05.2021

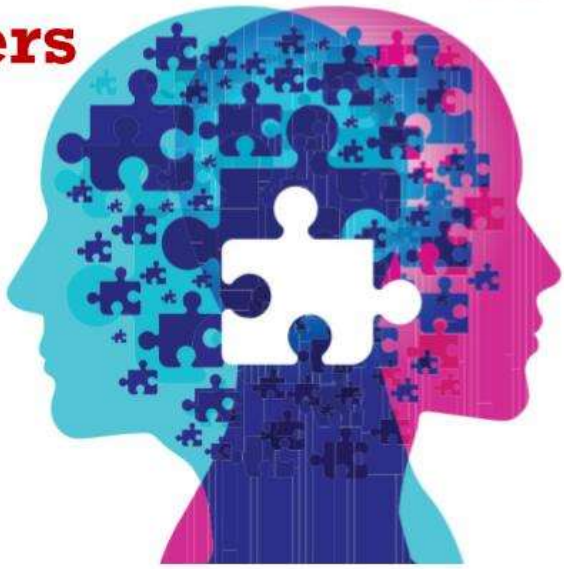
Please scan the QR code or click on the link below for more information and to enter the study:

https://tinyurl.com/3p57vzuy

Appendix B: Poster 2

UNIVERSITY OF LEEDS

Contribute to research and have the chance to win **£20 online shopping vouchers**



Clinical Psychology study interested in:

1) Childhood experiences
2) Relationships
3) Personality

Please scan the QR code or visit the link below for more information and to enter the study

https://tinyurl.com/3p57vzuy

Ethics approval: PSYC-270 18/05/2021

Appendix C: Proof of Ethical Approval

From: Graham Finlayson <G.S.Finlayson@leeds.ac.uk>
Sent: 18 May 2021 14:54
To: Daryl O'Connor <D.B.OConnor@leeds.ac.uk>
Cc: psceths <psyc-ethicssubmissions@leeds.ac.uk>; Graham Finlayson <G.S.Finlayson@leeds.ac.uk>
Subject: [SoP-REC] Ethics decision on PSYC-270

Hi Daryl,

Please accept this email as confirmation that your ethics application [Investigating factors that influence the relationship between childhood trauma and adult suicide] has been **conditionally approved** by the committee.
The ethics number is PSYC-270 and date of approval is 18/05/2021.

Comments to applicant: Supervisor signature needed on the application please. No delay to study but please resubmit the form with signature at earliest convenience.

Regards,

Graham

Bcc reviewer(s)

Professor Graham Finlayson | Chair of School of Psychology Research Ethics Committee
School of Psychology | Faculty of Medicine and Health | University of Leeds | +44 (0) 113 343 7601

Appendix D: Childhood Trauma Questionnaire (CTQ; Bernstein et al., 2003)

These questions ask about some of your experiences growing up as a child and a teenager. Although these questions are of a personal nature, please try to answer as honestly as you can. For each question, circle the number under the response that best describes your experience.

	When I was growing up...	Never True	Rarely True	Sometimes True	Often True	Very Often True
1.	I didn't have enough to eat	1	2	3	4	5
2.	I knew that there was someone to take care of me and protect me.	1	2	3	4	5
3.	People in my family called me things like "stupid", "lazy", or "ugly".	1	2	3	4	5
4.	My parents were too drunk or high to take care of the family,	1	2	3	4	5
5.	There was someone in my family who helped me feel that I was important or special.	1	2	3	4	5
6.	I had to wear dirty clothes.	1	2	3	4	5
7.	I felt loved	1	2	3	4	5
8.	I thought that my parents wished I had never been born.	1	2	3	4	5
9.	I got hit so hard by someone in my family that I had to see a doctor or go to hospital.	1	2	3	4	5
10.	There was nothing I wanted to change about my family.	1	2	3	4	5
11.	People in my family hit me so hard that it left me with bruises or marks.	1	2	3	4	5
12.	I was punished with a belt, a board, a cord, or some other hard object.	1	2	3	4	5
13.	People in my family looked out for each other.	1	2	3	4	5
14.	People in my family said hurtful or insulting things to me.	1	2	3	4	5
15.	I believe that I was physically abused.	1	2	3	4	5
16.	I had the perfect childhood.	1	2	3	4	5
17.	I got hit or beaten so badly that it was noticed by someone like a teacher, neighbour or doctor.	1	2	3	4	5
18.	I felt that someone in my family hated me.	1	2	3	4	5
19.	People in my family felt close to each other.	1	2	3	4	5
20.	Someone tried to touch me in a sexual way, or tried to make me touch them.	1	2	3	4	5
21.	Someone threatened to hurt me or tell lies about me unless I did something sexual with them.	1	2	3	4	5
22.	I had the best family in the world.	1	2	3	4	5
23.	Someone tried to make me do sexual things or watch sexual things.	1	2	3	4	5
24.	Someone molested me.	1	2	3	4	5
25.	I believe that I was emotionally abused.	1	2	3	4	5
26.	There was someone to take me to the doctor if I needed it.	1	2	3	4	5
27.	I believed that I was sexually abused.	1	2	3	4	5
28.	My family was a source of strength and support.	1	2	3	4	5

Appendix E: The Experiences in Close Relationships-Relationship Structures (ECR-RS; Fraley et al., 2011)

This questionnaire is designed to assess the way in which you mentally represent important people in your life. You'll be asked to answer questions about your parents, your romantic partners, and your friends. Please indicate the extent to which you agree or disagree with each statement by circling a number for each item.

[Responses to each item are gathered using a 7-point Likert scale from 1 (strongly disagree) to 7 (strongly agree)]

A. Please answer the following questions about your mother or a mother-like figure.

1. It helps to turn to this person in times of need.
2. I usually discuss my problems and concerns with this person.
3. I talk things over with this person.
4. I find it easy to depend on this person.
5. I don't feel comfortable opening up to this person.
6. I prefer not to show this person how I feel deep down.
7. I often worry that this person doesn't really care for me.
8. I'm afraid that this person may abandon me.
9. I worry that this person won't care about me as much as I care about him or her.

B. Please answer the following questions about your father or a father-like figure.

1. It helps to turn to this person in times of need
2. I usually discuss my problems and concerns with this person.
3. I talk things over with this person.
4. I find it easy to depend on this person.
5. I don't feel comfortable opening up to this person.

6. I prefer not to show this person how I feel deep down.
7. I often worry that this person doesn't really care for me.
8. I'm afraid that this person may abandon me.
9. I worry that this person won't care about me as much as I care about him or her.

C. Please answer the following questions about your dating or marital partner. Note: If you are not currently in a dating or marital relationship with someone, answer these questions with respect to a former partner or a relationship that you would like to have with someone.

1. It helps to turn to this person in times of need
2. I usually discuss my problems and concerns with this person.
3. I talk things over with this person.
4. I find it easy to depend on this person.
5. I don't feel comfortable opening up to this person.
6. I prefer not to show this person how I feel deep down.
7. I often worry that this person doesn't really care for me.
8. I'm afraid that this person may abandon me.
9. I worry that this person won't care about me as much as I care about him or her.

D. Please answer the following questions about your best friend:

1. It helps to turn to this person in times of need
2. I usually discuss my problems and concerns with this person.
3. I talk things over with this person.
4. I find it easy to depend on this person.
5. I don't feel comfortable opening up to this person.
6. I prefer not to show this person how I feel deep down.
7. I often worry that this person doesn't really care for me.
8. I'm afraid that this person may abandon me.

9. I worry that this person won't care about me as much as I care about him or her.

Appendix F: Perceived Stress Scale-Brief (PSS-Brief) (Cohen et al., 1983)

Original items

In the last month,

(1) how often have you felt that you were unable to control the important things in your life?
(2) how often have you felt confident about your ability to handle your personal problems?
(3) how often have you felt that things were going your way?
(4) how often have you felt difficulties were piling up so high that you could not overcome them?

Reworded Items

(1) Today, how often did you feel that you were unable to control the important things in your life?
(2) Today, how often did you feel confident about your ability to handle your personal problems?
(3) Today, how often did you feel that things were going your way?
(4) Today, how often did you feel difficulties were piling up so high that you could not overcome them?

Appendix G: Measures Administered as Part of Second Thesis Project

Barratt Impulsivity Scale II (Patton et al., 1995):

DIRECTIONS: People differ in the ways they act and think in different situations. This is a test to measure some of the ways in which you act and think. Read each statement and put an X on the appropriate circle on the right side of this page. Do not spend too much time on any statement. Answer quickly and honestly.

	① Rarely/Never	② Occasionally	③ Often	④ Almost Always/Always
1	I plan tasks carefully.			① ② ③ ④
2	I do things without thinking.			① ② ③ ④
3	I make-up my mind quickly.			① ② ③ ④
4	I am happy-go-lucky.			① ② ③ ④
5	I don't "pay attention."			① ② ③ ④
6	I have "racing" thoughts.			① ② ③ ④
7	I plan trips well ahead of time.			① ② ③ ④
8	I am self controlled.			① ② ③ ④
9	I concentrate easily.			① ② ③ ④
10	I save regularly.			① ② ③ ④
11	I "squirm" at plays or lectures.			① ② ③ ④
12	I am a careful thinker.			① ② ③ ④
13	I plan for job security.			① ② ③ ④
14	I say things without thinking.			① ② ③ ④
15	I like to think about complex problems.			① ② ③ ④
16	I change jobs.			① ② ③ ④
17	I act "on impulse."			① ② ③ ④
18	I get easily bored when solving thought problems.			① ② ③ ④
19	I act on the spur of the moment.			① ② ③ ④
20	I am a steady thinker.			① ② ③ ④
21	I change residences.			① ② ③ ④
22	I buy things on impulse.			① ② ③ ④
23	I can only think about one thing at a time.			① ② ③ ④
24	I change hobbies.			① ② ③ ④
25	I spend or charge more than I earn.			① ② ③ ④
26	I often have extraneous thoughts when thinking.			① ② ③ ④
27	I am more interested in the present than the future.			① ② ③ ④
28	I am restless at the theater or lectures.			① ② ③ ④
29	I like puzzles.			① ② ③ ④
30	I am future oriented.			① ② ③ ④

Momentary Impulsivity Scale (Tomko et al., 2014):

Participants respond using a 5-point Likert scale

(1 = very slightly or not at all; 2 = a little; 3 = moderately; 4 = quite a bit; 5 = extremely) describing how much each statement described their experience since the last completed prompt.

Since the last prompt…

1. I said things without thinking

2. I spent more money than I meant to

3. I have felt impatient

4. I made a “spur of the moment” decision

Appendix H: Participant Information Sheet

This project has been approved by the Research Ethics Committee of the School of Psychology at the University of Leeds – Reference number; PSYC-270. Date; 18.05.2021.

Principal Investigator: Professor Daryl O'Connor

Childhood Experiences, Relationships and Personality

We would like to invite you to take part in a research study on how childhood experiences influence adult relationships and personality. Before you decide whether to participate it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully and discuss it with others if you wish. Please email the researcher if there is anything that is not clear or if you require more information. Take time to decide whether or not you wish to take part.

Part 1 tells you the purpose of the study and gives a summary of what will happen if you take part.

Part 2 gives you more detailed information about the conduct of the study.

Part 1

What is the purpose of this project?
The current study aims to understand how past life events affects daily wellbeing, behaviour, and relationships. Individuals who have experienced adverse life events have been found to respond differently to stressful situations compared to those who have not experienced any adverse life events. However, studies which assess acute stress in a controlled laboratory setting only provide a 'snap shot' of stress and do not capture the real-world experience of every day stressors.

Using a daily diary approach this study will aim to investigate how people respond to stressful events which occur in their daily life. We will also explore how individuals with a history of suicidal thoughts or attempts differ in their psychological and physical response to stress compared to participants with no such history, and what additional factors influence this response.

Study summary
The entire study will be carried out by you in your home environment where you will complete an online diary every evening for seven consecutive days.

Why have I been chosen?
Approximately 300 adults will be taking part in this study. You are reading this information sheet because you responded to an advertisement for the research opportunity. Your eligibility to take part will be determined from your initial questionnaire responses, if you are aged over 18 years and fluent in English you will be selected to take part in the study.

Do I have to take part?
Participation is completely voluntary, and it is entirely your decision whether you wish to take part. If you decide to participate you can still withdraw from the study at any time by telling the researcher that you no longer wish to continue (contact childhoodexperiences@gmail.com). No questions will be asked about your decision.

What are the possible disadvantages and risks of taking part?
There is a small risk that due to the personal nature of some of the questions that parts of this study may be upsetting. You are free to stop at any time should you feel upset or distressed and do not have to answer any

questions you do not wish to. If you do feel any distress or negative emotions after the study we would recommend you contact your GP or one of the confidential services on the list of contacts that you will be provided with on the support sheet.

It may also be inconvenient for you to give up your time and to follow the task guidelines by completing a 5-minute questionnaire every evening for seven days. Therefore, you should think carefully about how you will feel about taking part and if you are able to commit to completing the consecutive seven days. However, it is important to remember that if you agree to take part you can withdraw at any point without having to explain your reasons.

What are the benefits of taking part?
Whilst there are no immediate benefits, the findings from the study will help contribute to our understanding of the factors associated with the health and wellbeing of adults under stress. In addition, the findings might help develop important health interventions in the future. There is a potential benefit of being entered into a prize draw to win one of 10 £20 online shopping vouchers should you complete the baseline survey and all seven daily-diary questionnaires.

What happens to the data collected and is it confidential?
Yes. All personal information will be handled in confidence, and we will strictly adhere to ethical practice. Detailed information is given in part 2.

Will I receive anything for taking part?
As a thank you for your time and participation for completing the entire study, you will be entered into a prize draw to win one of ten £20 online shopping vouchers for completing the baseline questionnaire in addition to the four consecutive daily diary studies.

If the information in Part 1 has interested you and you are considering participation, please read the additional information in Part 2 before making any decision.

Part 2
What will I have to do if I take part?
The entire study will take place in your home environment. You will be asked to complete an initial 15-minute baseline questionnaire, this will help determine if you are eligible to complete the study. You will also be asked to complete a brief online diary every night, lasting 5-minutes, for the following 7 days to reflect on your stress, behaviour, and wellbeing during the day.

What happens to the data collected and is it confidential?
All the information collected during the course of the study will be kept strictly confidential. After completing a consent form you will guided to create a unique study identity code and all data and samples will be recorded using this code. All personal information, such as your email, will be held separately to your answers. The link between your email and your unique identity code will be securely stored at the School of Psychology and will only be accessible by the research team. Your phone number will only ever be accessed to send you the seven daily diary questionnaires and to inform you if you are successful in winning an online shopping voucher. The data collected will only be used for research purposes, and individual participants will not be identifiable in any reports or publications.

What if I find that the study impacts my emotional wellbeing?
We will provide information about who to contact for support should you find that you are struggling with your wellbeing throughout the study. Although experiencing some distress when completing some of the questionnaires required in the study is normal, and to be expected, should you feel overwhelmed or find that your mental health is deteriorating, **we would encourage you to withdraw from the study.** If you should require immediate assistance, we would recommend that you contact your GP.

What will happen if I do not want to continue?
If at any point during the study you no longer wish to continue, you are free to withdraw without having to give an explanation for your reasons. If you decide not to continue during the course of the study, we ask that you inform a researcher (contact: chidhoodexperiences2021@gmail.com). We may wish to use the data you provide up until the point you drop out, however you also have the right to withdraw all your data from analysis up until the point of the prize draw**.** If you wish for your data to be removed, contact a researcher and provide your unique participant code created at the start of the study. After the ten participants have been selected for the prize draw, it will not be possible to withdraw your data from the study. Additionally, you will not be entered into the prize draw should you not complete baseline questionnaire and seven consecutive daily diary entries.

Who is organising and funding the research?
This research is being undertaken at the University of Leeds. There are no funding bodies included in this research.

Who has reviewed this study?
All research is assessed and approved by the School of Psychology Ethics Committee to protect your interests and wellbeing.

Who can I contact for further information?
If you have any remaining questions regarding your participation, you can contact either the principal supervisor Daryl O'Connor or the researchers Jasmine Maydom or Charley Blackwell using on the following contact details:

Researcher: childhoodexperences2021@gmail.com

Supervisor: Daryl O'Connor - d.b.oconnor@leeds.ac.uk / 0113 3435727

If you have any questions or concerns regarding ethical procedures related to this study, please contact the Chair of the Psychology Ethics Committee, by post at School of Psychology, University of Leeds, Leeds, LS2 9JT, by telephone on +44 (0) 113 343 7247.

Concluding Remarks
Finally, thank you for taking the time to read this information. If you have any additional questions do not hesitate to ask.

Appendix I: Consent Form

1. I confirm that I have read and understand the information sheet (version 1) shown previously explaining the research project and I have had the opportunity to ask questions about the project.

2. I understand that my participation is voluntary and that I am free to withdraw without giving any reason, and without there being any negative consequences. I understand that in order to withdraw, I must be able to give the research team my unique participant code. I understand that I will only be able to withdraw my data up to 14 days following participating in this research project. I understand that if I withdraw from the study, my data will be removed from the data set and permanently destroyed and will not be included in analysis.

3. I have read the Research Privacy Notice: https://ris.leeds.ac.uk/privacy-notice/

4. I understand that members of the research team will have access to my pseudonymised responses. I understand that my name or other personal data will not be linked with my questionnaire responses and I will not be identified or identifiable in the report or reports that result from the research. I understand that my responses will be kept strictly confidential.

5. I understand that the data collected from me may be stored and used in relevant future research in an anonymised form.

6. I agree to take part in the above research project, and understand that by clicking 'yes' in response to these questions, I am giving consent to participation.

Appendix J: Support Information

These are just some of the professional and voluntary organisations you can contact to get help in a crisis, or if you have been experiencing periods of low mood, stress or anxiety and wish to seek further support:

• You can always contact your GP or another healthcare professional for advice. If a health professional has given you a specific number to call when you are concerned about your condition, continue to use that number
• Leeds Survivor-Led Crisis Connect Helpline - 0808 800 1212. Open 18:00 - 22:30pm every evening of the year
• Samaritans - 116 123. Confidential, non-judgemental support available 24 hours a day for people who are experiencing feelings of distress or despair, including those which could lead to suicide. www.samaritans.org
• Dial House - 0113 260 9328. An out of hours service for people in crisis, open 18:00 - 02:00 Friday to Monday.
• NHS 111 - A service available 24 hours a day, every day of the year. Calls are free from landlines and mobile phones. You can call NHS 111 if you think you need to go to A&E or need another urgent care service, if you don't know who to call or don't have a GP, if you need health information, or reassurance about what to do next.
• If you are concerned that your life or someone else's life is in immediate danger, you should visit your nearest Accident and Emergency department (A&E) or call for an ambulance by dialling 999.

Appendix K: Debrief

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Childhood Experiences, Relationships, and Personality

This study aimed to investigate the relationship between childhood experiences, relationships, and personality. Previous research has found that those who have experienced childhood trauma or 'Adverse Childhood Experiences' (ACEs) are more vulnerable to suicidal thoughts and behaviour later in life. We are interested in what other factors contribute to this relationship, such as impulsivity, attachment style, and stress.

How was this tested?

In this study, you were asked to complete several questionnaires about your childhood experiences, suicidal thoughts and behaviours, and daily measures of mood and impulsivity. This data was collected for two Clinical Psychology Doctoral Theses.

Hypotheses and main questions:

We expect to find that:

- People who have experienced childhood trauma are more likely to respond impulsively to stress and low mood, and hence be at a higher risk of suicidal thoughts and behaviour
- People who have experienced childhood trauma, and who have a less secure attachment styles, may have a greater risk of experiencing thoughts of suicide.

Why is this important?

Suicide is an extremely serious public health problem worldwide, and we aim to further understand the risk factors that contribute to suicidal behaviour. These findings can potentially be used to create better targeted interventions for individuals at risk of suicide

What if I want to know more?

If you are interested in receiving a summary of the results when analysis is complete, please contact the researchers on chidhoodexperiences2021@gmail.com.

Thank you for participating in this research project. We hope that you have found it interesting and have not been upset by any of the topics discussed. However, if you have found any part of this experience to be distressing there are also a number of organisations listed overleaf that you can contact.