This thesis has been composed by the stated author as requirement for fulfilment of the Doctorate in Clinical Psychology (DClinPsychol) at the University of Edinburgh.

The work is the author’s own and has not been submitted for any other degree or professional qualification except as specified.

Please recognise the following terms of use:

- This work is protected by copyright or other intellectual property rights, which are retained by the thesis author unless specified otherwise.
- A copy can be downloaded for personal non-commercial research or study, without permission or charge.
- The thesis cannot be reproduced or quoted extensively from without first obtaining permission in writing from the author.
- The content must not be changed or sold commercially in any format or without the formal permission of the author.
- When referring to this work, full bibliographic details including the author, title, awarding institution and date of the thesis must be given.
Attachment Theory Clinical Applications and Daily-Well-Being in Adolescents: 
A Systematic Review and Experience Sampling Methodology Study

Jordan Anthony Bibby

Doctorate in Clinical Psychology
University of Edinburgh
June 2023
# Table of contents

Acknowledgements .............................................................................................................. 4

**Overall Thesis Abstract** .................................................................................................. 5

Lay Summary ......................................................................................................................... 6

**Chapter 1: Systematic Review** ......................................................................................... 8

- Title Page ......................................................................................................................... 8
- Abstract ............................................................................................................................. 9
- Introduction ....................................................................................................................... 10
- Materials and Methodology ............................................................................................. 14
- Results .............................................................................................................................. 41
- Discussion ......................................................................................................................... 51
- Limitations ....................................................................................................................... 54
- Clinical Implications and Future Research ....................................................................... 55
- Conclusion ......................................................................................................................... 56
- References ......................................................................................................................... 57

**Chapter 2: Empirical Study** ............................................................................................ 65

- Title Page ......................................................................................................................... 65
- Abstract ............................................................................................................................. 66
- Introduction ....................................................................................................................... 67
- Method ............................................................................................................................... 76
- Design ............................................................................................................................... 76
- Materials .......................................................................................................................... 78
- Procedure ......................................................................................................................... 78
- Measures ......................................................................................................................... 79
- Results .............................................................................................................................. 84
- Statistical Analysis ......................................................................................................... 85
- Discussion ......................................................................................................................... 93
- References ......................................................................................................................... 99

**List of Appendices**

- Appendix A .................................................................................................................... 106
- Appendix B .................................................................................................................... 109
- Appendix C .................................................................................................................... 116
I would firstly like to thank Professor Schwannauer, Dr Simona Di Folco, Koraïma Sotomayor Enriquez and Dr Emma Martin. The completion of this thesis would not have been possible without your guidance, advice and sharing of knowledge within the research group. I hope others can benefit just as much from the research group in the future.

To Dr Eleni Vasilopoulou. Thank you for giving your time from the goodness of your character. Your enthusiasm and reassurance during setbacks of the project were invaluable. Thank you for support in contacting clinicians across NHS Lothian, it is easy to see why you are well respected across teams and I look forward to continuing to work with you within the NHS.

Thank you to those who took part in this research, your time is greatly appreciated and has made this research possible.

Thank you to my family and Mollie, for supporting me throughout my journey in academia and career in psychology. Although this has meant moving away, you have always been a phone call away and been right behind me at every moment. My accomplishments are your accomplishments. Love you all.

Dedicated to Dad, I know you were proud to see me start this journey and I wish you were here to see its ending. You continue to be with me in everything I do.
Two independent pieces of research are presented within this thesis. Firstly, a systematic review is presented which investigated changes in attachment for adolescents following psychotherapeutic intervention. Insecure attachment has long been implicated as a risk factor for the development of mental health problems, whereas attachment security has been evidenced as a protective factor. Studies have shown that attachment is particularly amenable to change during adolescence, a developmental stage with the highest incidence rates of mental health problems. It is therefore important to synthesise research which has examined if attachment can change following psychotherapeutic intervention and what effect this may have on mental health related outcomes. The review identified 19 reports of 17 studies, utilising a range of psychotherapeutic interventions and across various mental health presentations. The results showed that adolescent attachment improved in 15 of the 17 studies; five studies employed appropriate analyses to find that changes in attachment preceded improvements in mental health related outcomes, suggesting a casual role of change in attachment. This review highlights the importance of considering attachment as a transdiagnostic treatment target, beyond that of assessment and formulation, within this vulnerable developmental period. The literature base would benefit from studies with appropriate control groups and homogenous use of attachment measures.

Secondly, an empirical research study investigated the attachment theory of emotion regulation, using a mix of cross-sectional and experience sampling methodology during the daily lives of 25 adolescents receiving mental health service interventions and peers attending mainstream schools. Attachment dimensions of avoidance and anxiety, emotion regulation, global anxiety and global depression were assessed with baseline questionnaires. Participants then completed items measuring daily negative and positive affect, social contextual factors, and attachment over a period of one week. Results of multiple regressions analyses found that baseline attachment styles were not associated with emotion regulation or global anxiety and global depression. However, results of multilevel models found that, when momentary attachment was added to attachment styles as a latent variable, lower attachment security predicted emotion regulation \( (p < 0.001) \) and daily negative affect \( (p < 0.001) \). Emotion regulation also predicted daily negative affect within this model \( (p < 0.001) \) and acted as a mediator between attachment and daily negative affect. For positive affect, attachment was not associated \( (p = 0.073) \). However, attachment predicted emotion regulation \( (p = 0.001) \), and emotion regulation predicted daily positive affect \( (p < 0.001) \). These results show the importance of measuring attachment within real-life contexts and support the attachment theory of emotion regulation during adolescence.
Thesis Lay Summary

This thesis involves two parts; firstly, a systematic review, whereby research studies on a particular subject are collated and examined to answer a question, and secondly, a research project.

Systematic Review

Attachment theory is well-founded and has led to fruitful research showing the importance of relationships with close others, particularly in early development, for lifelong mental health. Poor relationships with close others can lead to lower confidence and unhelpful ways of managing emotions, which increases the risk for mental health problems. Attachment to others has been identified as a key target in many psychotherapeutic interventions, with many therapies including ideas from this theory. Quite recently, it has been shown that attachment can improve following several psychotherapeutic interventions, but only in adults. This review sought to understand if attachment can change following such interventions for adolescents, a period of life when most mental health problems occur, and attachment is understood as highly changeable. This review found that in 15 of the 19 reports of studies, attachment did improve for adolescents following many different psychotherapeutic interventions and across many different mental health problems. Confidence in these findings would increase if future studies included participants who do not undergo intervention, so comparisons can be made with those who do.

Research Study

Adolescence is a period of life when mental health problems often develop. Research suggests that the close relationships individuals have in early life and during adolescence, can influence how likely somebody is to develop mental health problems. These relationships, or ‘attachment bonds’ are understood to impact mental health as they can shape how a person manages or regulates their emotions in each moment and how likely they are to rely on others for support. When relationships have been consistently supportive, this is understood to lead to ‘secure’ attachment; whereas when relationships have been inconsistent or difficult, ‘insecure’ attachment is understood to develop for a person. Whilst secure attachment increases the likelihood for good mental health, insecure attachment increases the likelihood for poor mental health. Although research has shown that attachment does affect mental health in this way, few studies have measured individuals’ attachment or their negative and positive emotions during daily life. This is problematic, as using questionnaires at one point in time can prevent individuals from remembering situations accurately,
and this does not reflect how attachment will affect emotions in real-life, moment-by-moment. For these reasons experience sampling methodology (ESM), which allows participants to answer questionnaires during daily life, was used. This study firstly examined how differences in attachment affect emotion regulation and levels of anxiety and depression, using questionnaires are one time point. Next, participants completed questionnaires during their daily lives with ESM, through a mobile phone application. This was for a period of one-week, multiple times a day. Overall, 25 adolescents attending NHS mental health services or mainstream schools took part. The results showed that when attachment was measured with questionnaires at one time point, no relationship was found between attachment, emotion regulation or anxiety and depression. However, when attachment and emotions were measured during daily life, lower levels of attachment security led to higher levels of negative affect. Lower levels of attachment security did not impact daily levels of positive affect, but did increase emotion regulation, which increased positive affect. The results suggest that attachment influenced emotion regulation, and this impacted the experience of daily levels of affect. Also, that attachment should be measured during daily lives within future research.
Chapter 1: Systematic Review.

Change in Adolescent Attachment as an Outcome of Psychotherapeutic Intervention: A Systematic Review

Jordan Anthony Bibby

Author Email:

Key Words: Attachment, Intervention, Psychotherapy, Adolescence, Mental Health.

Highlights:

- Attachment is amenable to change following psychotherapeutic intervention.
- Changes in attachment precede changes in mental health outcomes.
- Changes in types of attachment dimensions leads to unique outcomes.
Abstract

Objectives: This review aimed to systematically synthesise research which has investigated changes in attachment following psychotherapeutic intervention for adolescents, and how changes in attachment relate to mental health outcomes.

Method: The electronic databases of PsycINFO, MEDLINE, ProQuest, Embase, PsycARTICLES, CINAHL and the Cochrane Library, ProQuest Dissertations and Theses and OpenGrey, were searched using four search sets which were linked with the Boolean term, “AND”. All terms within a search set were linked with the Boolean term, “OR”. A wildcard asterisk was also used to search for related terms when required. The first search set included the term “attachment”. The second search set included the terms “Child*”, “Adolescent*”, “teen*”, “youth” and "young people". The second search set included the terms “avoidan*”, “anxi*”, “ambivalen*”, “preoccup*”, “disorgan*”, “secur*”, “insecur*”, “fearful”, “state”, “style”, “beHAVio*”, “relationship” and “representation”. The fourth search set included the terms “Psychotherap*”, “therap*”, “intervention”, “psycholog*”, “treatment” and “program”. Inclusion and exclusion criteria were applied. Quality assessments of studies guided interpretation.

Results: 19 reports of 17 studies were included in this review. 15 of the 19 reports found that attachment improved following various psychotherapeutic interventions and across clinical patient groups, therapy settings, adolescent ages, study methodology and study quality. Several studies show unique improvements in attachment styles to specific psychological problems.

Conclusion: Attachment during adolescence appears amenable to change following psychotherapeutic intervention. The literature will benefit from studies which utilise matched control groups and appropriate analyses to consider the causal role of changes in attachment to psychological health.
Introduction

The World Health Organisation has identified the global need for development of psychosocial interventions aimed at improving parent-child interactions and the regulation of stress during child and adolescent development (Britto et al., 2017). With over five decades of research, attachment theory has long emphasised the importance of early caregiving experiences for lifelong developmental outcomes. The theory considers psychological and interpersonal mechanisms which are hypothesised to be alterable with psychological intervention (Bowlby, 1969; Bowlby, 1988; Ainsworth, 1978). As such, attachment theory has provided a comprehensive framework for the development of such interventions, mainly for infant populations (Bakermans-Kranenberg et al., 2003; Zeanah et al., 2011; Cicchetti et al., 2006; Mountain et al., 2017). Translation of attachment theory to interventions for adolescent populations has been hampered due to issues with measurement, methodology and theoretical conceptualisation of attachment unique to this age group (Kobak, 2015). There is a need to understand the therapeutic benefit of the transdiagnostic treatment target of attachment applied to this age group.

Attachment theory (Bowlby, 1969; Ainsworth et al., 1978; 2015) explains that for healthy socioemotional development, infants seek proximity to primary caregivers, who act as a safe haven, where distress can be regulated, and a secure base, from which confidence in exploration can occur (Bowlby, 1969). When these conditions are met through consistently sensitive caregiving, a secure attachment is formed (Bowlby, 1969; Ainsworth, 1978). However, when quality of caregiving is poor, insecure attachment patterns are likely to emerge. Insecure anxious attachment patterns are usually a response to inconsistent caregiver support and involve heightened expression of and rumination on negative affect, and a lack of exploration without the caregiver present; insecure avoidant attachment patterns are usually a response to a lack of sensitive caregiver responses and involve a deactivation of attachment behaviours towards the caregiver and emotional experience, despite distress and vulnerability (Bowlby, 1988; Mikulincer & Shaver, 2012).

Cross-sectional and longitudinal research has shown that insecure attachment patterns are a risk factor for poorer socioemotional development, in comparison to secure attachment patterns, as well as physical and mental health during childhood (Deklyen & Greenbergn, 2008). Considering the mechanisms behind this relationship, researchers have proposed that these individual differences in attachment patterns shape emotion regulation abilities, which in turn mediate the relationship to psychological health outcomes, such as anxiety and depression (Main, 1990; Mikulincer & Shaver, 2019). Evidence has supported this hypothesis for child, adolescent and adult populations.
The same models suggest that attachment anxiety and attachment avoidance make unique contributions to internalizing and externalizing behaviour problems, respectively (Brumariu & Kerns, 2010; Malik et al., 2015; Mikulincer & Shaver, 2012).

Meta-analyses of longitudinal studies, from early childhood to adolescence, show moderate to large effect sizes between both patterns of attachment insecurity and internalising and externalising problems, however, evidence is weaker for avoidant attachment (Brumariu & Kerns, 2010; Groh et al., 2017). Within these reviews, those studies with poorer methodological quality showed smaller effects sizes. Additionally, effect sizes were larger for studies which employed questionnaires rather than behavioural or representational measures of attachment. This was also the case for measures which have relied on parental or teacher reports of behaviours and focussed on presentations other than depression, suggesting that third-person reports may underestimate levels of non-observable psychosocial problems (Groh et al., 2017). In fact, 75% of studies within the review by Groh et al. (2017) relied on parental reports of temperament rather than attachment measures per se. As such, effect sizes are likely inflated within the literature. Additionally, associations were stronger for pre-adolescence/adolescence when compared to childhood. Clearly, the relationship between attachment and developmental outcomes is complex and can depend upon methodology and various characteristics of the population under study.

Since attachment insecurity has been shown to be a risk factor for developmental outcomes, it can be hypothesised that changes to attachment insecurity may improve such outcomes in psychological treatment. Indeed, several systematic reviews show that psychological interventions which target attachment security can positively improve outcomes for infants and children aged under 13 years (Zeanah et al., 2011; Wright & Edginton, 2016; Mountain et al., 2017). Studies focusing on infant populations include only attachment or observed parental sensitivity as an outcome in this age group, as classification and diagnostic systems are often inappropriate. Additionally, interventions in this age group focus on parent-child relationships and on improving the parents’ awareness of the child’s emotional experience (Moretti et al., 2015). As such, they are qualitatively different from psychological interventions designed for adult populations and cannot be generalised.

On the other hand, for adult populations, attachment-based interventions are scarce, and attachment is usually measured as a secondary outcome to targeted symptoms. A systematic review by Taylor et al. (2015) showed that several types of psychological therapies increase attachment security and decrease attachment insecurity for adult populations, even if these do not focus on attachment security overtly. Studies within this review failed to employ analyses accounting for
mechanisms of change in attachment and psychopathology, and the use of control groups were rare. As such, it could be that attachment and psychopathology change in tandem during treatment, or measured change is the result of overlapping constructs. This is particularly problematic due to criticisms that terms in attachment theory are overly broad and vague (Rutter, 2014).

More recently, attachment-based interventions have been developed for adolescents, such as the parenting group ‘Connect’ and Attachment-Based Family Therapy (ABFT; Moretti & Obsuth, 2009; Diamond et al., 2010) with promising findings for improvement of internalizing and externalizing symptoms, as well as depressive symptoms and suicidal ideation. However, effect sizes become small when compared with an active comparator. Additionally, the authors of the ‘Connect’ programme showed that specific changes in parents’ representations, and each dimension of attachment insecurity, uniquely improved aspects of affect regulation and consequently problem behaviours (Moretti & Obsuth, 2009; Moretti et al., 2015). Although promising initial findings, during adolescence, attachment becomes an even more complex construct which can be measured according to cognition and across various hierarchical relationships (Fraley, 2019). For example, the most widely used and well-validated self-report measures used in adolescence are the Inventory of Parent and Peer Attachment (IPPA, Armsden & Greenberg, 1987) and the Experiences in Close Relationships Scale-Revised (ECR; Fraley et al., 2000; Jewell et al., 2019).

Whilst the IPPA measures quality of relationships as a proxy for attachment, along dimensions of alienation, communication and trust, with parents and peers, the ECR-R requires adolescents to respond with general relationships in mind, and scores fall along dimensions of attachment avoidance and attachment anxiety. Differences become even more pronounced when interview methods are also considered, which may measure unrelated constructs of attachment (Jewell et al., 2019). Also, within this age range, presenting problems in clinical settings are rarely categorised as broad internalising and externalising behaviours, and instead mental disorder diagnoses based on discrete symptoms are often given according to manuals (American Psychiatric Association, 2013; The World Health Organisation, 2018). As such, findings from these attachment-based interventions may not correspond to clinical settings. The varied ways in which attachment can be conceptualised and targeted, and mental health outcomes can be measured, has led to heterogeneity between studies within this age group, with methods arbitrarily used from either infant or adult populations.

To synthesise attachment interventions for adolescence, Kobak et al. (2015) proposed a framework, based on attachment theory, including the most important treatment targets of psychological interventions which aim to alter attachment. These included overt discussion and psychoeducation of caregiver IWM and adolescent IWM, as well as patterns of communication in the parent-
adolescent dyad. However, it was noted that there was a lack of clinical trials to support this framework. Unlike for infant or adult populations, interventions for this age groups may involve direct group or individual work, involve the parent(s) solely or not at all, and overtly target attachment and/or diagnosable mental health conditions (Kobak et al., 2015; Law et al., 2019). Since this publication, several trials of psychological treatment have been conducted which include measurements of attachment as an outcome. Jugovac et al. (2022) conducted a meta-analysis on attachment- and emotion-focussed parenting interventions for child and adolescent internalizing and externalizing behaviours and found these to be effective when compared to waitlist control-groups. This review, however, did not consider interventions which did not include parents or were general psychological interventions. Additionally, it was not specified if included studies measured attachment as an outcome, meaning the mechanisms of change of interventions are not known.

Understanding the effects of psychological treatments on attachment outcomes are particularly important for the developmental period of adolescence. Adolescence has been defined as a period of ‘storm and stress’, with the increasingly highest prevalence of mental health problems occurring at this stage of life (Casey et al., 2010; Rapee et al., 2019; Bor et al., 2014). This has been compounded by world events such as the Covid-19 pandemic (Panchel et al., 2021). Research has indicated that this is due to several reasons including: biological change, such as puberty and brain development, a related increase in the frequency and intensity of experienced emotions (with lagged development of emotion regulation), independence from parents, more reliance on peers for support, and more frequent relationship ruptures (Haglet et al., 2019; Somerville, 2013; Bailen et al., 2019). In conjunction with this, evidence suggests that attachment representations and behaviours are especially turbulent during adolescence, possibly due to the adaptive process of becoming independent from caregivers (Jones et al. 2018). Given the implications that changes in attachment have for psychopathology and life outcomes during the critical period of adolescence, it is paramount to investigate the effect that psychological treatments have on attachment and the secondary improvements in psychological outcomes. Such findings will also have considerable implications for the development of attachment theory (Brumariu, 2015).

**Rationale for review and research questions**

Subsequently, the aims of this review were to provide a synthesis and critically evaluate the studies which have investigated changes in attachment security (and insecurity) following psychological intervention for adolescents.

**Questions.** The following questions informed the review:
i) Can psychological treatment change attachment for adolescents presenting with psychopathology and/or identified psychosocial problems?

ii) If psychological intervention can change attachment for adolescents, what association does this have with mental health outcomes?

**Material and methodology**

This review protocol was submitted and registered on PROSPERO (CRD42022357647).

**Inclusion and exclusion criteria**

*Inclusion criteria* were studies that included (i) treatment trials which used a pre- and post-treatment measurement, or post-treatment comparison with a treatment and control group(s), (ii) a validated self-report or interview measurement of attachment for adolescence, either by caregivers or adolescents, (iii) participants aged 10-21 years, according to the World Health Organisation definition of adolescence (WHO; 2023; https://www.who.int/health-topics/adolescent-health#tab=tab_1; age increased from 20 to 21 years, to account for participants who are aged between 20-21 years), whom presented with a mental health or interpersonal problem, (iv) included an intervention delivered by a qualified mental health professional or professional with training in the described psychological intervention (v) were published between 2010 and September 2023, and (vi) were written in English.

*Exclusion criteria* were studies that (i) were of qualitative designs (ii) single case studies, (iii) did not include a measure of attachment for adolescents, (iv) did not include a psychological intervention, and (v) conference extracts.

**Search Procedure**

A literature search was conducted following liaison with an expert librarian within the School of Health in the Social Science department at the University of Edinburgh. Databases were chosen if they covered content and research related to healthcare interventions and were targeted at healthcare professionals, students, and educators. Databases were also chosen if they covered research relating to child development, family and health, and contained peer reviewed and full-paper articles. Regarding grey literature, databases were included to prevent publication bias and ensure rigorous searching, as upcoming research which may not have been published could be included. Inclusion of grey literature is suggested by the Cochrane handbook (Higgins et al., 2023) for these reasons. Additionally, databases were included if they were described to contain research relating to intervention studies with methodologies such as randomised-controlled trials, controlled trials, and non-controlled trials. Consequently, the following databases were utilised in the search
process: PsycINFO, MEDLINE, ProQuest, Embase, PsycARTICLES, CINAHL and the Cochrane Library. The search procedure also included the following grey literature electronic databases: ProQuest Dissertations and Theses and OpenGrey. These databases include international research from PhD and dissertation studies and include research content related to

The computerised search used four search sets and were linked with the Boolean term, “AND”. All terms within a search set were linked with the Boolean term, “OR”. A wildcard asterisk was also used to search for related terms when required. The first search set included the term “attachment”. The second search set included the terms “Child*”, “Adolescen*”, “teen*”, “youth” and "young people". The second search set included the terms “avoidan*”, “anxi*”, “ambivalen*”, “preoccup*”, “disorgan*”, “secur*”, “insecur*”, “fearful”, “state”, “style”, “behavio*”, “relationship” and “representation”. The fourth search set included the terms “Psychotherap*”, “therap*”, “intervention”, “psycholog*”, “treatment” and “program”. Limiter terms were also used if available with the specific database, such as ‘English language’, or those relating to the specified age ranges for inclusion.

In addition to these searches, references of identified studies and reviews within the topic area were also manually screened. No studies were identified by these means.

Duplicates were removed by the electronic software, Covidance (n.d.), and titles and abstracts were screened by two reviewers (JB and JF) independently, using a written description of the inclusion and exclusion criteria. Articles which did not meet inclusion criteria were removed. Full texts of remaining articles were obtained and screened for eligibility by two reviewers (JB and JF).

**Search Results**

The search and exclusion processes are illustrated in Figure 1, according to PRISMA guidelines (Page et al., 2020).

A total of 1,447 articles identified from the search processes. 110 were retained following screening of titles and abstracts. Titles and abstracts were screened according to the inclusion criteria. The full text of these articles were then assessed according to the eligibility criteria. Of these, 34 were removed due to age range of the participants; a further 35 were removed due to the lack of attachment measure used; 17 more articles were removed due to study design; two articles were removed due to being published in non-English; two were removed due to being a duplication and one was removed due to non-journal article format. Based upon the search strategy, 19 reports of 17 studies were included in this review. Please see Figure 1 for the PRISMA flow chart and Table 1 for a description of each included study.
Records identified from Databases (n = 1,447) → Records removed before screening: Duplicate records removed by software automatically (n = 116)

Records screened (n = 1,331) → Records excluded via researcher screening (n = 1,221)

Reports sought for retrieval (n = 110) → Reports excluded: Incorrect age range (n = 34)
No attachment measure (n = 35)
Incorrect study design (n = 17)
Duplication (n = 2)
Non-journal article (n = 1)
Published in non-English (n = 2)

Reports assessed for eligibility (n = 110)

Studies included in review (n = 17)
Reports of included studies (n = 19)

Quality appraisal

Quality appraisal was completed for each study included in the review to guide interpretation of findings. The Effective Public Health Practice Project (EPHPP; Armijo-Olivo et al., 2012) quality assessment tool was used in this review. The EPHPP assesses quality of quantitative studies using the following methodological designs: observational, cross sectional, before and after studies and RCTs. It therefore suited the broad range of studies included in this review and allowed standardised comparison.

The EPHPP assesses study quality across six sources of potential bias: A) selection bias, B) study design, C) confounders, D) blinding, E) data collection methods and F) withdrawals and drop-outs. Each of the domains are given a rating of 1) ‘Strong’, 2) ‘Moderate’ or 3) ‘Weak’. An overall rating for each study is then given based off these scores. If a study has no ‘Weak’ rating, it is classified as ‘Strong’; with one ‘Weak’ rating it is classified as ‘Moderate’ and with two or more of the same it is classified as ‘Weak’.

Quality assessment was completed by two reviewers (JB and JF) for all included studies. Agreement rate was 84% between the two reviewers, for the EPHPP. Disagreements were resolved by discussion with referral to the EPHPP dictionary and guidelines.

Overview of studies

Intervention type and presenting problems

Overall, there were 10 studies describing RCTs; three pairs of these studies described three RCTs. Five studies described non-controlled trials and three studies described controlled trials. Finally, one study described a pilot non-controlled trial. Studies were conducted in various countries. There were 2,155 participants in the included studies. Participant ages ranged from 10 to 21 years. 11 of the studies used random sampling methods from hospital admissions or via clinical referrals (5,6,7,9,11,13,14, 15,16,17,19); one of these studies included a sample from an in-patient hospital, and one from a specialist risk-assessment team, whereas the rest were outpatient services. Three studies included samples from local schools. Two studies recruited participants from parent-referred or child-welfare led residential programs. The remaining studies utilised mixed methods, including self-selection and clinical referrals, except for one study which did not report on the sampling procedure (9).

The presenting problems reported for participants across studies included mixed presentations, including depression, anxiety, relational problems, Attention Deficit Hyperactivity Disorder (ADHD), substance dependence, and oppositional defiant disorder (five studies); behavioural problems (three
studies); Eating disorders (three studies); Trauma, including post-traumatic stress disorder symptoms (three studies); depression (one study); self-harm (one study); chronic physical health conditions (one study); suicidal ideation (one study); family relational issues (one study); and intolerance of uncertainty/academic procrastination (one study).

Regarding therapy format and type, seven studies utilised a group therapy (2,4,5,8,10,11), whereas eight studies had an individual approach (6,7,9,12,14,16,17). The two remaining studies included both individual and group sessions (1,3). In conjunction with this, six of these studies had therapy interventions which included adolescents only (1,4,8,9,18,19); all of these studies except one (18) included participants who presented with depressive symptoms or measured depression symptoms as an outcome. Meanwhile, 10 studies included interventions whereby both parents and adolescents received the therapy intervention (3,5,6,7,10,12,14,15,16,17). Two studies included parents/caregivers only, with aims to improve attachment security of their adolescents (2,11). One study (15) did not report on the format of the intervention.

**Measurement and conceptualisation of attachment**

All but one study (15) used self-report measures of attachment. This study utilised the Heidelberg Attachment Style Rating for Children and Adolescents (HASR-CA) via interview method. The most common self-report measure used was the Inventory of Parent and Peer Attachment (IPPA; Armsden & Greenberg, 1987), included in seven studies, although variations of the measure were used also (3,4,5,6,10,16,17); one study used only the items relating to attachment to peers only (6; therefore, this was the IPA). One study used multiple attachment measures, including the IPPA, as well as The Adolescent Attachment Questionnaire (AAQ: West et al. 1998) and The Adolescent Unresolved Attachment Questionnaire (AUAQ: West et al. 2000). Five studies used the Experiences in Close Relationships Questionnaire – Revised (9, 12,13, 14, 19). Other measures used included the The Relationship Structures Questionnaire (RSQ; Fraley & Heffernan, 2008); The Reduced version of the CaMir questionnaire for the evaluation of attachment (CaMir-R; Balluerka et al., 2011); short version of the Adolescent Attachment Anxiety & Avoidance Inventory (AAAAI; Moretti & Obsuth, 2009); The Comprehensive Adolescent–Parent Attachment Inventory (CAPAI; Moretti et al., 2000); Coping Strategies Questionnaire, CSQ (Finnegan et al. 1996) and Security Scale (Kerns et al. 1996). Only one study (11) measured attachment changes for mothers also, whereas no studies measured attachment changes in fathers or other caregivers. There was no apparent relationship between publication year and attachment measure used, although all studies were conducted after 2011, with no validated and replicated instruments developed since this time (Jewell et al., 2019).
All studies but one (15) analysed attachment on continuous dimensions. Stefini et al. (2013) calculated a categorical linear model based on the four attachment styles (secure attached, insecure-avoidant, insecure-ambivalent and disorganized-disoriented) and analysed the repeated measurement factor, from beginning to end of therapy. The remaining studies which analysed attachment according to continuous dimensions varied in terms of the dimensions included, according to the measures used. The most common conceptualisation of attachment was according to the two dimensions of attachment anxiety and attachment avoidance, with low scores on both reflecting high attachment security. This conceptualisation included studies which used the ECR, or variations thereof, the CAPAI (Moretti et al., 2000), the Adolescent Relationships Questionnaire (Bartholomew & Horowitz, 1991), the Coping Style Questionnaire (Finnegan et al., 1996), the Relationship Structures Questionnaire (Fraley et al., 2006) and the Adolescent Attachment Anxiety & Avoidance Inventory (AAAAI; Moretti & Obsuth, 2009). Studies which utilised the IPPA (Armsden and Greenberg, 1987) or variations of this, conceptualised attachment according to the dimensions of degree of mutual trust, quality of communication, and anger and alienation within specified relationships. Only Cloutier et al. (2021) utilised both measures, allowing comparison between both measures following a single intervention. Vivona (2000) described a method, using discriminant functional analysis with the IPPA (Armsden & Greenberg, 1987), to transform scores into the secure, ambivalent (or anxious) and avoidant dimensions comparable with others measures. However, no study utilised this method. There was no apparent relationship between therapy format (adolescent only/parent only or parent-child dyads) and measures used.

10 studies (2,7,8,10,12,13,15,16,17,18) assessed participant at follow-up using chosen measures. Follow-up length ranged from three months to 12 months, with a mean length of 5.9 months.
<table>
<thead>
<tr>
<th>Study, year (year began*)</th>
<th>country</th>
<th>Design</th>
<th>Sample (demographics and presenting problem)</th>
<th>Therapy Intervention</th>
<th>Therapy format</th>
<th>Duration (weeks)</th>
<th>Attachment Measurement</th>
<th>Other measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baluerka et al. (2014) 1</td>
<td>Spain</td>
<td>Controlled trial</td>
<td>21 (M age 15.19, 8 F, 13 M) years. 25 (M age 15.6, 6 F, 19 M).</td>
<td>Animal assisted therapy in residential setting. Control group resided in the residential centre, with the same daily activities except AAT.</td>
<td>34 sessions. Group (23 session) and individual (11 sessions).</td>
<td>12 weeks</td>
<td>Reduced version of the CaMir questionnaire for the evaluation of attachment (CaMir-R; Balluerka, Lacasa, Gorostiaga, Muela, &amp; Pierrehumbert, 2011)</td>
<td>NA</td>
</tr>
</tbody>
</table>

Participants ages ranged from 12-17 years. Behaviour disorders and depressive anxiety disorders. Severe adaptation difficulties to residential care facility.
<table>
<thead>
<tr>
<th>Study 1: 50 mothers of adolescents (mean age 14.90; SD = 1.30)</th>
<th>Study 1: 50 mothers of adolescents (mean age 14.88, SD = 1.84)</th>
<th>attachment-based parenting intervention CONNECT control group received treatment-as-usual at their respective centre</th>
<th>In each center, the Connect parent group program (Moretti et al., 2009) was delivered by two certified leaders who guided groups of 8–14 mothers through 10 90-min sessions.</th>
<th>All mothers attended at least 7 of the 10 sessions (70%); the mean participation rate was 91%.</th>
<th>16-item short version of the Adolescent Attachment Anxiety &amp; Avoidance Inventory (AAAAI; Moretti &amp; Obsuth, 2009).</th>
<th>25-item Strengths and Difficulties Questionnaire (SDQ-parent version; Goodman, 1997)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Study 2: 20 mothers and 20 adolescents (Mage = 14.90, SD = 1.29)</td>
<td>Study 2: 20 mothers and 20 adolescents (Mage = 14.90 (SD = 1.55)</td>
<td>60% male</td>
<td>60% male</td>
<td>Seeking referral for behavioural problems</td>
<td>7 weeks</td>
<td>The Adolescent Attachment Questionnaire (AAQ: West et al. 1998).</td>
</tr>
</tbody>
</table>

**Barone et al. (2021)**

Italy

- Study 1: 50 mothers of adolescents (mean age 14.90; SD = 1.30)
  - 62% males
- Study 2: 20 mothers and 20 adolescents (Mage = 14.90, SD = 1.29)
  - 60% male

- 16-item short version of the Adolescent Attachment Anxiety & Avoidance Inventory (AAAAI; Moretti & Obsuth, 2009).
- 25-item Strengths and Difficulties Questionnaire (SDQ-parent version; Goodman, 1997)

**Bettman & Tucker (2011)**

USA

- Pre-and post-intervention cohort
- 96 adolescents placed by their parents in a wilderness therapy program
  - 59 males (61.5%) and 37 females (38.5%).
- Participants ranged in age from 14 to 17, with a mean age of 15.98 (SD = 20.98).
Presenting with various difficulties (76% oppositional defiant disorder, 66% depressive disorders, 51% substance dependence, 38.5% ADHD, 37.5% parent-child relational problems, 12.5% anxiety disorders).

At the program’s end, the adolescents’ families travelled to the wilderness site for a 3-day family therapy process, which included a 1-day psycho-educational parenting workshop and a 2-day therapeutic experience in the wilderness with their children.

The Inventory of Parent and Peer Attachment (IPPA: Armsden and Greenberg 1987) is a 75 item, Likert-type self-report measure of an adolescent’s attachment to their parents and peers. The IPA was developed from the Inventory of Parent and Peer Attachment (IPPA) by Armsden and Greenberg (1987) and translated by Huang (2007). Twenty-five items were included in the National Groups.

Music Therapy Groups provided 40 min of music therapy twice per week. The control group maintained its typical routine. Music therapy provided by the National Groups.

Chen et al. (2019) conducted a pre-test-post-test control group design on 29 females in the music group = M age = 12.19 (SD = 0.397) and 27 females in control = M age = 12.24, SD = 0.435. The Beck Depression Inventory-II was used by the researchers to collect saliva samples at a fixed time during the 1st and 10th music sessions.

Control group received no intervention.

Designated researchers. The IPA, and they were evaluated on a 5-point Likert scale (Lino & Lima, 2017).

65 individuals (33 with one drop out. Between 12-13 years old.

Depressive symptoms

BRAVA is a novel brief group treatment that is DBT- and ABFT-informed to decrease suicidal behavior and increase family cohesion for youth presenting with mild-to-moderate suicidal ideation.

Groups by experienced MH clinicians (psychiatrist and psychologist) and co-led by a child and youth counsellor (CYC) or a master’s level social worker (MSW). Consisted of six, 90-min group modules for adolescents and caregivers, conducted over 6 weeks.

Inventory of Parent and Peer Attachment (IPPA; Armsden & Greenberg, 1987).

Caregivers only: Relationship Scale Questionnaire (RSQ; Griffin & Bartholomew, 1994).

concurrently but separately. Once per week.

Adolescents and caregivers: Perceived Stress Scale (PSS; Cohen, Kamarck, & Mermelstein, 1983).

The mother form of IPPA (Armsden & Greenberg, 1987) to appraise the quality of child’s attachment to mother. The mother’s attachment to child was assessed by mother’s attachment to child subscale of the PSI.

The Illness Perception Questionnaire (IPQ; Sockford et al., 2007)

The parent stress inventory (PSI; Deater-Deckard & Scarr, 1996)

The 28-form General Health Questionnaire (GHQ-28) (Furukawa et al. 2001).

The 28-form Child Health Questionnaire (CHQ-28; Janssens et al., 2008)
Children 12–18 years old, with a chronic immunology defect or thalassemia or kidney disease and confined to the Tehran Pediatric Medical Center Hospital for a minimum of 3 months, as well as their mothers.

Diamond et al. (2013) 7 USA Cohort (pre and post non-controlled trial) 10 adolescents Aged from 14 to 18 years (M = 15.10, SD = 1.37).

Eight were female and 2 were male.

Four of the cases included both parents, and 6 included the mother only.

Adolescents were admitted to private psychiatric hospitals, presenting with suicidal ideation. They self-identified as lesbian, gay or bisexual.

Attachment-Based Family Therapy, adapted for LGBTQ youth.

Mother-child dyad 12–16 weeks manualized family based treatment.

The adapted model included more time alone with parents (3–5 sessions)

12 weeks. Duration of each session not reported.

An average of 12 sessions per family (range = 8–16 sessions).

Eloranta et al. Palestine Randomized-controlled- Teaching Recovery Waiting list Group format with adolescents 16 hours in total Attachment was measured by the Emotion Regulation Questionnaire

Diamond et al. (2013) 7 USA Cohort (pre and post non-controlled trial) 10 adolescents Aged from 14 to 18 years (M = 15.10, SD = 1.37).

Eight were female and 2 were male.

Four of the cases included both parents, and 6 included the mother only.

Adolescents were admitted to private psychiatric hospitals, presenting with suicidal ideation. They self-identified as lesbian, gay or bisexual.

Attachment-Based Family Therapy, adapted for LGBTQ youth.

Mother-child dyad 12–16 weeks manualized family based treatment.

The adapted model included more time alone with parents (3–5 sessions)

12 weeks. Duration of each session not reported.

An average of 12 sessions per family (range = 8–16 sessions).

Eloranta et al. Palestine Randomized-controlled- Teaching Recovery Waiting list Group format with adolescents 16 hours in total Attachment was measured by the Emotion Regulation Questionnaire
with PTSD symptoms, living within a heavily bombed area.
Participants were 40 adolescents. Mean age was 14.8 (SD = 1.8).

Demographics of individual groups not reported.

77.5% of the sample was female and 22.5% was male.

Adolescents presented with depression, anxiety, ADHD, oppositional defiant disorder.

IPT-A (Mufson, Dorta, Moreau, et al., 2004) with 12 sessions.

Additional sessions administered to non-responders, as well as fluoxetine.

IPT-A was delivered by 12 trained therapists. Therapists included 3 clinical psychologists and 9 graduate students.

Pharmacotherapy was delivered by one child psychiatrist.

Adolescents began treatment with an initial treatment plan of 12 sessions of IPT-A delivered within 16 weeks. Median (SD) session attendance was 12.0 (1.62) for adolescents assigned to receive 12 IPT-A sessions and 15.00 (4.16) for adolescents assigned to 16 IPT-A sessions.

Experiences in Close Relationships—Revised The ECR (Brennan, Clark, & Shaver, 1998)

Schedule for Affective Disorders and Schizophrenia for School-Age Children (K-SADS; Chaput, Fisher, Klein, Greenhill, & Shaffer, 1999).

Children's Depression Rating Scale—Revised (CDRS-R; Poznanski & Mokros, 1996).
<p>| Study, year (year began*) | country | Design | Sample (demographics and presenting problem) | Therapy Intervention | Therapy format | Duration (weeks) | Attachment Measurement | Other measures |
|--------------------------|---------|--------|---------------------------------------------|---------------------|---------------|------------------|------------------------|----------------|------------------|
|                          |         |        | 107 (M = 14.54 (SD = 1.44)). | SB-PFT consists of 10 weekly 2-hr sessions. | | | | Antisocial and criminal behaviour questionnaire (Seisdedos, 1995). |
|                          |         |        | adolescent boys: 47.57% adolescent girls: 52.43% | (Keiley, Zaremba-Morgan, Datubo-Brown, Pyle, &amp; Cox, 2015). | | | | |
|                          |         |        | adolescents recently enrolled in Child Welfare Services age 11–17 years old | | | | | |
|                          |         |        | adolescents recently enrolled in Child Welfare Services (intervention group only), presenting with behavioural, conduct and family relational problems. The control group received no intervention. | | | | |</p>
<table>
<thead>
<tr>
<th>Study</th>
<th>Country</th>
<th>Design</th>
<th>Participants</th>
<th>Intervention Duration</th>
<th>Outcome Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moretti et al. (2015)</td>
<td>Canada</td>
<td>Parents (N = 540) cohort trial</td>
<td>540 adolescents (261 girls, Mage = 14.05, SDage = 2.33 and 279 boys, Mage = 13.87, SDage = 2.82).</td>
<td>Parent groups 10 week, manaulize, 9 sessions.</td>
<td>The Comprehensive Adolescent–Parent Attachment Inventory (CAPAI; Moretti, McKay, &amp; Holland, 2000).</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Parents who attended the program were referred by community mental health centres or schools due to concerns regarding their teen’s mental health and behavioural functioning.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rimane et al. (2022)</td>
<td>Germany</td>
<td>Multicentre RCT</td>
<td>43, (Mage = 18.27, SD = 2.26) 42, (Mage = 18.02, SD = 2.22)</td>
<td>Cognitive Processing Therapy Individual and parent-child dyad (Matulis et al., 2014 for a more detailed description).</td>
<td>16–20 weeks. thirty 50-minute sessions with the possibility of extending treatment by six optional sessions, either for joint sessions with the caregiver or the translated German version (Ehrenthal et al., 2009) of the Experiences in Close Relationships—Revised Questionnaire (ECR-R; Fraley et al., 2000) using two dimensions—AR anxiety and AR avoidance.</td>
</tr>
</tbody>
</table>
total of 15 additional sessions were added at the beginning and end of therapy (Matulis et al., 2014).

for crisis intervention. Participants in the WL/TA group were given instructions for finding a psychotherapist outside the study.

<table>
<thead>
<tr>
<th>Study</th>
<th>Country</th>
<th>Study Design</th>
<th>Sample Size</th>
<th>Mean Age (SD)</th>
<th>Gender</th>
<th>Treatment</th>
<th>Duration</th>
<th>Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rimane et al. (2021)</td>
<td>Germany</td>
<td>multicentre, RCT (same trial as above).</td>
<td>43, (Mage = 18.27, SD = 2.26)</td>
<td>Same as above</td>
<td>Same as above</td>
<td>Same as above</td>
<td>Same as above</td>
<td>German translation of the University of California at Los Angeles Post-traumatic Stress Disorder Reaction Index (Steinberg et al., 2004; UCLA-PTSD-RI)</td>
</tr>
<tr>
<td>Russouw &amp; Fonagy (2012)</td>
<td>United Kingdom</td>
<td>RCT</td>
<td>40 (Mage = 15.4, SD = 1.3).</td>
<td>MBT-A 22 child and adolescent mental health workers from Individual and family sessions. 50 minutes per session and all sessions were audiotaped.</td>
<td>12 months</td>
<td>Mentalization was assessed using the How I Feel (HIF) questionnaire (unpublished data, 2008).</td>
<td>The Risk-Taking and Self-Harm Inventory (Vrouva et al., 2010; RTSHI), Self-reported self-</td>
<td></td>
</tr>
</tbody>
</table>
different professional backgrounds received 6 days’ training in MBT-A and MBT-F.

TAU group received the individual therapeutic intervention alone (28%), consisting of counselling, generic supportive interventions (24%), cognitive behavioural therapy (19%) or psychodynamic psychotherapy (19%); a combination of individual therapy and family work

Attachment status was assessed using the Experience of Close Relationships Inventory (ECR) harm was confirmed by an interview at baseline and at 12 months, using the Childhood Interview for DSM-IV Borderline Personality Disorder (American Psychiatric Association; CI-BPD).

Mood and Feelings Questionnaire (MFQ; Angold et al., 1995).

Borderline Features Scale for Children (Crick et al., 2005; BPFS-C).
Participants were referred due to self-harm behaviours.

**Stefini et al. (2013)**

- **Germany**
- **Pre- and post-trial (cohort)**
- 71 children and youths with a mental disorder (according to the ICD-10). 43 (60.56%) were girls and 28 (39.44%) were boys. The average age was 11.3 years. Forty-eight (67.60%) patients were children under 13 and the remaining 23 (32.40%) were youths.

- Thirty-three (50.7%) of the disorders were classified as internalized, 8 (11.3%) as externalized, and the other 27 cases (38.0%) as mixed disorder.

**Wallis (2017a)**

- **Australia**
- **RCT.**
- Participants ($n = 57$) were a mean age of 49, (M age = 14.61 years (1.45; Family-based treatment (FBT).

- The mean length of admission was 30.60

- The validation of the HASR-CA showed a significant correlation with the scales of the German version of the Inventory of Parent and Peer Attachment (IPPA).
subset from a previously reported randomised controlled trial investigating the role of inpatient weight restoration prior to outpatient family-based treatment. (1.36; range: 12.4–19.05 years).

FBT therapists were three psychologists and a social worker.

age-matched and gender-matched.

days (SD = 16.07, range: 18–81).

20 sessions of FBT with 12 months follow-up.

As this period averaged 14 months from baseline for the AN group, the NC group was reassessed at the same time period after their initial assessment.

The IPPA and only the mother and father scales were used in this study.

Centre for Disease Control (CDC) growth charts (Kuczmarski, 2000).

Eating Disorder Examination (EDE) Global Score (Fairburn et al., 1993).

The Schedule for Affective Disorders and Schizophrenia for School Aged Children (KSADS; Puig-Antich & Chambers, 1978; Kaufman et al., 1996). with both patient and parent(s) interviewed.

Revised Child Anxiety and Depression Scale (RCADS; Choprita et al., 2000).

Children’s Obsessional...
participants met DSM-IV criteria for AN of less than 3 years duration and were medically unstable at admission.

Control group were adolescents without an eating disorder recruited from schools.
<table>
<thead>
<tr>
<th>Study</th>
<th>Country</th>
<th>Design</th>
<th>Sample</th>
<th>Age</th>
<th>Treatment</th>
<th>Measures</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wallis (2017b)</td>
<td>Australia</td>
<td>RCT (sub sample of the Madden et al., 2015 paper, and from same wider sample collected in Wallis et al., 2017).</td>
<td>57, Mage = 14.72 years (SD = 1.39). No control groups.</td>
<td>Same as above</td>
<td>Same as above</td>
<td>Adolescents attachment relationship quality with parents was assessed with the Inventory of Parent and Peer Attachment (IPPA-45).</td>
<td>Same as above</td>
</tr>
<tr>
<td>Yildiz et al. (2021)</td>
<td>Turkey</td>
<td>Pre-post controlled trial (cohort analytic).</td>
<td>12 students (aged 13-14 years) participated in each of the groups. The research was conducted on 12 secondary school students 6 of whom were girls and 6 of whom were male in the experimental group.</td>
<td>Adolescents</td>
<td>Group</td>
<td>During the practice of the psychoeducational intervention program of Celik (2004), which is designed based on attachment styles.</td>
<td>In the program, 90-min psychoeducational sessions carried out in the experiment group for 8 weeks and 8 sessions.</td>
</tr>
</tbody>
</table>
Participants in the intervention group were selected based on highest scores for intolerance of uncertainty and academic procrastination.

Participants were 40 adolescents participating in a clinical trial of four adaptive treatment strategies for adolescent depression.

IPT-A (Mufson et al., 2004).

See Gunlicks et al. 2016).

12 sessions. 16-week

IPT-A was delivered by 12 trained therapists. Therapists included 3 clinical psychologists and 9 graduate students.

Pharmacotherapy was delivered by one child psychiatrist.

Experience in Close Relationships—Revised. The ECR-R (Brennan et al., 1998)


Dysfunctional Attitudes Scale. The DAS (Weissman & Beck, 1978)
Quality Ratings

Quality ratings are presented in Table 2. Overall, five of the studies (7, 12, 14, 16,17) were rated as ‘STRONG’ according to the EPHPP assessment tool, completed by the two reviewers. Eight studies were rated as ‘MODERATE’ (9, 13,11,10,8,6,2, 19) and six studies were rated as ‘WEAK’ (1,3,4,5,15,18). The most common cause for ‘weak’ ratings amongst studies was due to lack of blinding or lack of reporting of blinding (eight studies). Lack of reporting of blinding was overall the greatest source of bias across studies. The second most common source of bias and ‘weak’ ratings were the lack of reporting for participant withdrawals or drop-outs (six studies). The third most common cause of bias amongst studies was Selection Bias, being rated as ‘Weak’ for six studies. This was the second greatest source of bias across studies, as many studies included samples whom self-referred to the study or were referred by researchers in an unsystematic procedure. One study (1) was rated as strongly, due to being RCT or CCTs, but rated poorly in the domain of confounders (C), due to differences amongst the treatment and control group. Indeed, four of the 10 RCT studies were rated as ‘Weak’. One RCT, Maya et al. (2020), was rated a ‘Strong’ in all domains except for Blinding Bias, due to lack of reporting of participants’ awareness of the research question, and for Withdrawals and Drop-outs, due to reporting follow-up data for the treatment group only. All studies reported valid and reliable measures and were rated as ‘Strong’ in this domain, with except for (5), which was rated as ‘Moderate’ due to incomplete reporting of validity and reliability scores for all measures.

For intervention integrity, which is not counted towards overall quality ratings, only three studies (7,14,16) ensured 80-100% of participants received the intended treatment, prevented likely contamination of other therapies for participants, and measured the consistency of the intervention.

Regarding analyses, which is also not counted towards overall quality ratings within the EPHPP, only six studies accounted for attrition rates by using intention-to-treat analyses (2,9,12,13,14,19); two pairs of these studies also reported on two of the same trials (9+19, 12+13).
<table>
<thead>
<tr>
<th>Study</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baluerka et al. (2014) 1</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>WEAK</td>
</tr>
<tr>
<td>Barone et al. (2021) 2</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>MODERATE</td>
</tr>
<tr>
<td>Bettman et al. (2011) 3</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>3</td>
<td>WEAK</td>
</tr>
<tr>
<td>Chen et al. (2019) 4</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>WEAK</td>
</tr>
<tr>
<td>Cloutier et al. (2021) 5</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>WEAK</td>
</tr>
<tr>
<td>Dehghani-Arani Et al. (2018) 6</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>MODERATE</td>
</tr>
<tr>
<td>Diamond et al. (2013) 7</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>STRONG</td>
</tr>
<tr>
<td>Eloranta et al. (2017) 8</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>MODERATE</td>
</tr>
<tr>
<td>Gunlick-Stoessel et al. (2019) 9</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>MODERATE</td>
</tr>
<tr>
<td>Maya et al. (2020) 10</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>3</td>
<td>WEAK</td>
</tr>
<tr>
<td>Study</td>
<td>A</td>
<td>B</td>
<td>C</td>
<td>D</td>
<td>E</td>
<td>F</td>
<td>Quality</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---------</td>
</tr>
<tr>
<td>Moretti et al. (2015)</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>MODERATE</td>
</tr>
<tr>
<td>Rimane et al. (2022)</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>STRONG</td>
</tr>
<tr>
<td>Rimane et al. (2021)</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>MODERATE</td>
</tr>
<tr>
<td>Russouw &amp; Fonagy (2012)</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>STRONG</td>
</tr>
<tr>
<td>Stefini et al. (2013)</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>WEAK</td>
</tr>
<tr>
<td>Wallis (2017)</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>STRONG</td>
</tr>
<tr>
<td>Wallis (2018)</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>STRONG</td>
</tr>
<tr>
<td>Yildiz et al. (2021)</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>WEAK</td>
</tr>
<tr>
<td>Zhou et al. (2021)</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>MODERATE</td>
</tr>
</tbody>
</table>

Note. A = Selection Bias, Study Design, C = Confounders, D = Blinding, E = Data Collection Methods, F = Withdrawals and Drop-outs. 1 = Strong, 2 = Moderate, 3 = Weak for quality assessments within each domain.
Results

To answer the research questions set out in this review, the findings from studies will be presented in corresponding headings, including attachment focussed interventions, general psychological treatments and the relationship between changes in attachment and other outcomes of interest.

Attachment Focussed Interventions. Attachment focussed interventions targeted both parents and adolescents (5,6,7), parents only (2, 11) or adolescents only (18).

Parent interventions. The two studies targeting parents only used the parent-group intervention ‘Connect’ (Moretti & Obsuth, 2009). The Connect programme is proposed to enhance attachment security and decrease attachment insecurity in the parent-child dyad, through increasing parents’ recognition of and sensitive responding to attachment needs of the adolescent, apparently underlying problem behaviours (Moretti et al., 2015). Barone et al. (2021) was a RCT and used the SDQ-parent version (Goodman, 1997), whereas Moretti et al. (2015) was a cohort non-controlled trial and used The Brief Child and Family Phone Interview (BCFPI; Cunningham et al., 2000) and The Affect Regulation Checklist (ARC; Moretti, 2003). Also, both studies analysed the mechanisms of change via the effect of change in attachment avoidance and anxiety on internalising and externalising behaviours.

Barone et al. (2021) found a large group effect for anxious attachment (F [1,98] = 10.03, p = .002, d = 0.880), in favour of the connect group reporting lower adolescent attachment anxiety than the control group, whereas no effect was found for avoidant attachment (F [1,98] = 3.13, p = .080, d = 0.354). However, when considering results at 4-month follow-up, the interaction between group and time was significant for both avoidant (F [2196] = 8.38, p < .001, d = 0.928) and anxious attachment (F [2196] = 17.27, p < .001, d = 1.000). No group effect was found for externalizing problems (F [1,96]) = 1.28, p = .262, d = 0.201), but there was a group effect for internalizing problems (F [1,96] = 4.07, p = .047, d = 0.475), with the Connect group mothers reporting lower internalizing problems than control group mothers. Despite no group effect of on externalising problems at post-intervention, the interaction between group and time was significant for internalizing (F [2196] = 4.08, p = .018, d = 0.597) and externalizing problems (F [2196] = 9.34, p < .001, d = 0.950). Moretti et al. (2015) analysed results with repeated measures MANOVA and found significant reductions in internalizing (d = .19), externalizing (d = .37), attachment avoidance (d = .22) and attachment anxiety (d = .09; F [5, 535] = 38.59, p < .001).

The studies shared several characteristics, in number of sessions attended by mothers (required 70%) and intervention integrity (via the Connect manual). Participants were also referred via mental
health clinics for adolescent behavioural problems, although only Moretti et al. (2015) reported percentages of presenting problems. This may explain the differences in effect sizes, since Moretti et al. (2015) found a greater decrease in externalizing symptoms for those in the clinical range compared to those in the subclinical range (F(1) = 49.83, p < .001). Barone et al. (2021) therefore may have included more severe clinical presentations in adolescents, with resultant larger effect sizes. Additionally, Barone et al. (2021) included a much smaller sample size, possibly over-inflating the effect sizes found (Kuhberger et al., 2014). This may also be the case regarding the measures used in Barone et al. (2021), since they used a reduced 16-item version (AAAI; Moretti & Obsuth, 2009) of the same 36-item measure used by Moretti et al. (2000; CAPAI), potentially polarising any changes in scores following intervention. On the other hand, Barone et al. (2021) included measurement of adolescent attachment to increase confidence in mother reports, and found a significant interaction between group and time, with lower scores in the connect group, for adolescent avoidant attachment (F [2232] = 3.06, p = .049, d = 0.621) and adolescent anxious attachment (F [2195] = 5.45, p = .005, d = 0.995). Since significant reductions in externalizing problems and avoidant attachment only occurred when the 4-month follow-up was considered, Moretti et al. (2015) may have underestimated the effect of the connect programme by measuring outcomes only three weeks following treatment.

**Parent-child dyad interventions.** Three of the studies included participants referred from medical hospitals (5,6,7), whereas one included participants selected from a single school. In the study by Cloutier et al. (2021), the novel BRAVA intervention was used, following a developed treatment manual, and based on ABFT and Dialectical Behavioural Therapy (DBT). This study aimed to improve suicidal ideation, with group sessions conducted separately but concurrently, for adolescents and parents. In this study, there were significant decreases, according to adolescent self-report measures, for suicidal ideation (p = <0.001, d = 0.82), symptoms of depression (p = 0.001, d = 0.70), anxiety (p = 0.006, d = 0.54), perceived stress (p = <0.001, d = 1.10) and parental measure of avoidant attachment (as per the RSQ; p = 0.19, d = 0.45). However, there were no significant differences for attachment to primary caregivers, as measured by the IPPA for adolescents.

Diamond et al. (2013) similarly targeted adolescents presenting with suicidal ideation and used ABFT, tailored for lesbian, gay, bisexual, transgender and queer populations. This intervention also followed a manual but was double the length (12 weeks) and number of sessions (12 session) than that of Cloutier et al. (2021). For the 10 participants included in the study there was a significant decrease in suicidal ideation over the course of treatment (F[2,18] = 18.78, p<.001, d = 2.10). There was also a significant decrease in depressive symptoms over the course of treatment, (F[2, 18] = 4.59, p<.03, d = .90). on all 10 participants revealed that there was a significant decrease in suicidal
ideation over the course of treatment, (F[2,18] =18.78,p<.001,d=2.10). A completer analysis conducted on only those 8 participants completing treatment found similar results, (F[2, 14] =38.16,p<.001,d = 3.76). Regarding attachment, there were no significant changes, although effect sizes were moderate to large for both attachment anxiety and attachment avoidance. A completer analysis on five participants revealed significant reductions in attachment anxiety (F[2, 8] = 10.89, p<.005, d =1.25) and attachment avoidance (F[2, 8] =4.31, p<.05, d =1.50), suggesting poor power with the small sample sizes included.

Dehghani-Arani et al. (2018) used the MCDT model for adolescents with a chronic immunology defect or thalassemia or kidney disease, including their mothers. The MCDT model considers the child and mother’s quality of interactions and specifically focuses on thoughts, feelings and behaviours for each. The model also involves psychoeducation of relationship patterns. This study again included a small sample size. Positively, the control group received similar contact time with the same psychotherapist as the treatment group. Like Cloutier et al. (2021), the IPPA was used to measure attachment following intervention, and revealed significant changes in child’s attachment to mother (F1,21 = 7.25, p = .02) and mother’s attachment to child (F1,21 = 9.87, p = .00) in the experimental group only. The Eta squared coefficients showed an effect size of 38. There were also significant changes with improvements in the treatment group, as compared with the control group, for physical symptoms (F1,21 = 10.22, p = .00), anxiety (F1,21 = 4.52, p = .04), depression (F1,21 = 6.26, p = .02), and general health (F1,21 = 9.34, p = .00). The Eta squared coefficients show an effect size of .41, .34, .32, and .54, respectively. No significant changes were found in either group for mothers’ illness perception (F 1,21 = 1.93, p = .18, eta squared = .11). Whilst the treatment and control groups were matched well on demographic and baseline variables, withdrawal and drop-out rates were not reported following eligibility screening for participants, thus limiting interpretability.

**Adolescent only interventions.** Whilst all interventions included a component of psychoeducation regarding attachment relationships, Yildiz et al. (2018) included a purely psychoeducation programme as intervention. This novel intervention was based upon a thesis publication of a group format treatment, to improve attachment security in university students (Celik, 2004), and adapted to be applicable for procrastination and intolerance of uncertainty. The control group in this study received no intervention. Whilst the authors used the Adolescent Relationship Scales Questionnaire (RSQ) developed by Bartholomew and Horowitz (1991) at baseline and post-intervention in this study, and attributed significant reduction only in the treatment group, in intolerance of uncertainty at post-intervention and follow-up (F [1–22] = 108.077; p < .01), and academic procrastination at post-intervention and follow-up (F [1–22] = 14.315; p < .01), the authors did not report scores on the RSQ at post-intervention. Despite this, it is stated that the significant changes in outcome measures
are due to acquisition of secure attachment style in the treatment group, but not control group. The groups also had a significant difference in pre-test scores of attachment anxiety and withdrawals reasons were not reported, leading to confounders.

**General Psychological Interventions.** Studies using general psychological treatments each varied with the type of treatment used and therapy format. Whilst two studies investigated the effects of Interpersonal Psychotherapy for Adolescents (19,9), these described one trial. This was also the case for Wallis et al (2017a) and Wallis et al. (2017b) who investigated Family Based Treatment for adolescents with eating disorders and compared outcomes with non-clinical peers without an eating disorder, and Rimane et al. (2021; 2022), who included adolescents with PTSD following childhood physical or sexual abuse and were provided with developmentally adapted cognitive processing therapy (D-CPT).

**Randomised controlled trials.** The trial conducted by Gunlick-Stoessel et al. (2019) was one of six studies to use an intent-to-treat analysis. In this study, participants were randomized to receive fluoxetine or increased frequency of IPT-A sessions, if they had insufficient treatment response; they were randomized at either time points of week four or week eight. Those with sufficient treatment response continued with IPT-A sessions as scheduled. Two linear mixed models found that there was a significant and large linear time effect in both ECR-R Anxiety [estimate = −0.10, SE = 0.03, F(1, 31) = 15.11, p < .001, d = .79] and ECR-R Avoidance [estimate = −0.12, SE = 0.03, F(1, 31) = 16.89, p < .001, d = .83] after controlling for medication status. These results indicated that adolescents had a significant decrease in both attachment anxiety and attachment avoidance from baseline to week 16. Additionally, medication status had no significant impact on ECR-R scores. This study did well to control for potential confounders, with no significant differences between groups on key variables at baseline. However, the sample selected was drawn from the general population, utilising adverts and flyers, with weekly financial incentives for participation, meaning generalisability of findings to clinical populations is poor. Zhou et al. (2021) utilised the same analysis method, although included measures of dysfunctional attitudes to establish mechanisms of change between reduced attachment anxiety and avoidance and depression.

Wallis et al. (2017a;2017b) found that there was also no difference between the treatment or control groups in attachment quality at post-treatment assessment, and both had a reduction in attachment quality as per the IPPA-45 (Wilkinson & Goh, 2014), for mothers (F[2, 103.20] =4.45, p = .014) and fathers (F[2, 99.75] = 4.28, p = .016). Whilst one RCT has shown remission rates of FBT for adolescents with eating disorders at 49.3%, some authors have argued that the treatment fails to target family functioning and relationship quality, which are indicated within ED development.
(Wagner et al., 2016), and the treatment should be augmented with these factors. Furthermore, the participants in this study were assessed during the acute phase of treatment and admission to inpatient services, with higher ED psychopathology and shorter duration of illness. Whilst the authors state that a reduction in attachment quality was likely the natural trajectory of adolescent development, one study has found that attachment avoidance and attachment anxiety increases from ages 11 years to 17 years, although with greater variability in attachment anxiety (Ruhl et al., 2015). Overall attachment security in this study also depended on measures relating to specific social experiences with peers, and those with eating disorders are more likely to experience negative social experiences overall (Sweetingham & Waller, 2008). As the control groups in these studies were adolescents from mainstream schools, without eating disorders, it is unknown what the trajectory of attachment quality would have been in the study for adolescents with eating disorders, who did not receive treatment (i.e., the treatment may have led to similar attachment quality levels to non-clinical peers, rather than a projected decline that otherwise would have occurred).

Rimane et al. (2022) utilised multilevel modelling, and found significant fixed effects with negative estimates for a time variable (from baseline to 6-months follow-up) in an attachment-as-outcome model (attachment related anxiety: $b = -0.0022, t_{[23.132]} = -2.687, p = .013$; attachment related avoidance: $b = -0.0025, t_{[21.695]} = -3.112, p = .005$). This effect was also found for the waitlist/treatment as usual group (WL/TA), but only for attachment anxiety scale ($b = -0.0018 t_{[23.345]} = -2.086, p = .048$). However, it should be noted that the follow-up period was only 3 months in the WL/TA group. Additionally, the authors limited participants included in the analyses to those who completed at least three assessments, meaning only 26 participants of 43 were included. An intention-to-treat analysis would have provided evidence of applicability and utility of the intervention. Since the WL/TA group varied in treatment provided, with 45% receiving unspecified treatments and the rest receiving no treatment, comparisons are difficult to make.

Rimane et al. (2021) conducted alternative analysis, including effect sizes for any changes in attachment at each assessment point. Additionally, in this study of the same trial, it was reported that the D-CPT group differed significantly at baseline to the WL/TA group, with higher WL/TA scores for AR anxiety (WL/TA: $M = 4.09$, $SD = 1.24$; D-CPT: $M = 3.54$, $SD = 1.20$; $t_{83} = 2.06, p = 0.043$). Additionally, the authors reported that post-treatment assessments were completed on average at 27.59 ($SD = 8.10$) weeks in the D-CPT group and at 22.41 ($SD = 3.98$) weeks in the TAU group. Similar to Rimane et al. (2022), only scores in the D-CPT group reduced from baseline to follow-up ($t_{23} = 3.66, p = 0.001, d = 0.75$).
Another study RCT which incorporated an active control group was Russouw & Fonagy, (2012). This study compared mentalization-based treatment for adolescents (MBT-A) to TAU, which involved routine care provided by community-based adolescent mental health services, incorporating evidenced-based interventions. Importantly, there was no statistically significant difference in the modality (individual, family, psychiatric, or other) or duration of the treatments between the groups and the specific treatments offered were reported; these included counselling (38%), generic supportive interventions (24%), (cognitive-behavioural therapy (19%), psychodynamic psychotherapy (19%) and psychiatric review alone (27.5%), which were delivered both individually or with family work. In addition to this, the authors found no significant difference between the groups with clinical attention given, nor a difference in the number of participants in each group completing intervention. Such controls increase the confidence in the findings. A significant reduction was found in attachment avoidance (as measured by the ECR-R) over the 12-month course of treatment, only in the MBT-A group with a medium effect size (p< .001, d = 0.42). This trial was one of few which reported blinding of both participants and outcome assessors, indicating that it was unlikely that knowledge of assignment to treatment or control arms affected the results. The small sample size in this study may have been conducive to the medium effect size reported, although this was likely impacted by the inpatient/clinical nature of the sample.

In another RCT, Eloranta et al. (2017) included a large same size of 242 participants receiving a psychosocial intervention of Teaching Recovery Techniques (TRT; based upon CBT strategies), compared with 240 participants in a waiting-list control group. Both groups were recruited from schools in the Northern Gaza Strip, who were suffering from PTSD symptoms after repeated bombings in the area. They participated at baseline, before the intervention, and at 3- and 6-months follow-ups. Secure attachment was associated with decreased mental health symptoms in the TRT ($\beta = .45, CR = 3.41, p < .0001$) and control ($\beta = .46, CR = 4.52, p < .0001$) groups. Also, insecure, avoidant attachment was associated with increased mental health symptoms, but only in the control group ($\beta = -.27, CR = -2.54, p < .01$). The direct effects of attachment orientation accounted of mental health problems 45 % in the TRT and 41 % in the control groups. In this study, participant families were aware of assignment to groups, due to full descriptions provided to families. The study utilised the Coping Strategies Questionnaire (CSQ; Finnegan et al., 1996) and the Security Scale (SS; Kerns et al. 1996). These measures were developed for middle childhood, matching the age range of participants; the CSQ includes items relating attachment related behaviours towards the mother, whereas the SS assess children’s perceptions attachment security with a chosen attachment figure.

Non-randomised controlled trials. Maya et al. (2020) utilised Scene-Based Psychodramatic Family Therapy (SB-PFT), developed by the same authors (Maya et al., 2018). This treatment combines
theoretical principles of family therapy and psychodrama, with a focus on developing adolescents’ emotional intelligence. In this study, participants were referred from child welfare services in Spain, and received SB-PFT or no intervention. Results showed no significant changes in attachment security for the treatment group, but there were significant decreases for the control group in parental communication \( F(1, 102) = 8.15, p < .01, \eta^2 p = 0.07 \) and parental trust \( F(1, 102) = 8.08, p < .01, \eta^2 p = 0.07 \) as measured by the IPPA (Armsden & Greenberg, 1987). Such findings suggest that the treatment may have prevented a natural course of decline in attachment security for adolescents with behavioural and relational problems, showing the strengths of including a control group with similar presenting problems/diagnoses. However, there were differences at baseline in parental attachment (parental communication: \( F[1, 216] = 9.79, p < .01 \); parental trust: \( F[1, 216] = 20.66, p < .00 \); parental alienation: \( [1, 216] = 21.31, p < .001 \) and antisocial behaviour \( F[1, 216] = 10.38, p < .01 \) in favour of the CG. Findings may have been due to these confounding differences at baseline.

Only one study (Stefini et al., 2013) used both interview and self-report measures, with corresponding dimensional and categorical analyses. In this study, following analytic psychotherapy, 74.6% of participants had a significant reduction in the Severity of Impairment Score for Children and Adolescents (SIS-CA) at post-treatment, \( (d = 1.95 [F 70, 1 = 222.76]; p = 0.001) \) and at the 12-month follow-up, \( (F 63, 1 = 363.23; p = 0.001; \text{effect size not reported}) \). The authors found that attachment style, as measured by interview and according to categories, significantly changed, with a time effect of \( \chi^2 = 43.01 (p = 0.001) \) from the beginning to the end of therapy. At the end of treatment, 63.4% of participants were classified as being securely attached, compared with 20% at prior to treatment.

**Novel interventions.** Three studies included interventions which were non-manualised and novel (Chen et al., 2019; Balluerka et al. 2014; Bettman & Tucker, 2011). Balluerka et al. (2014) and Chen et al. (2019) both used a cohort analytic methodology. Balluerka et al. (2011) found that animal-assisted therapy led to a statistically significant improvement regarding the dimension of attachment security, with a large effect size \( t (20) = 2.236; p = 0.037, d = 0.69 \), according to the CaMir-R (Balluerka et al., 2011). The CaMir-R was not included in a review of attachment measures used in adolescence (Jewell et al., 2019), and includes items related adolescent representations of family functioning, not only attachment. There are five factors included; factor 1 refers to secure attachment, factors 2 and 3 to preoccupied attachment, factor 4 to avoidant attachment, and factor 5 to disorganized attachment. There were no significant changes exhibited on these measures of family functioning. There were also no significant differences between the treatment and control groups, although the effect sizes were moderate for attachment security, in favour of the treatment group \( d = 0.43 \). This treatment was theoretically based, in part, from attachment-based
psychotherapy (Bowlby, 1988). This study did not report on baseline or demographic information for either group, or intervention integrity, limiting interpretability.

Chen et al. (2019) included adolescents only aged 12-13 years, utilising peer-preferred music therapy. This therapy was structured and involved selecting songs and engaging in karaoke with peers within a group. The need for mutual dependence was addressed using musical activities. Only one participant withdrew from the treatment group, with the reason reported and no differences were found between groups on outcome measures or demographics. The peer attachment items of the IPPA (Armsden and Greenberg, 1987) were used only. The covariance between the groups shows a significant difference in peer attachment after 10 weeks ($F[1,61] = 15.040, p < 0.001, \eta^2 = 0.198$), in favour of the music therapy group.

Bettman & Tucker (2011) also utilised the IPPA (Armsden & Greenberg, 1987), although with the full 75-item measure, including items for adolescents’ attachment to their mothers, fathers, and peers. Similar to Balluerka et al. (2014), the intervention was completed within a residential setting, however, parents had chosen to refer their children to the program. The authors also included The Adolescent Unresolved Attachment Questionnaire (AUAQ: West et al. 2000) and The Adolescent Attachment Questionnaire (AAQ: West et al. 1998) self-report measures, to assess different aspects of attachment, including empathy towards attachment figures (AAQ) and perceived failed protection from parents (AUAQ). The presenting problems of participants were divided between diagnoses of oppositional defiant disorder (76.0%), depression (65.6%), substance dependence (51.4%), ADHD (38.5%) and substance abuse (33.3%). Regarding the AAQ, adolescents reported less confidence in the availability and responsiveness of their parents ($t = -5.16, df = 53, p < .001$) and less empathy for their parents’ feelings (goal-corrected partnership) by the end of treatment ($t = -6.30, df = 53, p < .001$). Together these scores led to a decreased perception of attachment security by the participants as shown in the changes in the total AAQ score ($t = -5.48, df = 53, p < .001$). For the AUAQ, no significant differences were found between the pre and post scores for participants on any of the three subscales or the total score for the AUAQ. Scores on the IPPA revealed a decrease in alienation/anger by the end of treatment towards their mother ($t = 3.791, df = 50, p < .001$) but not fathers ($t = 3.667, df = 47, p = .08$). On the other hand, participants perceived their parents to be significantly less sensitive and responsive to their emotional states (mother: $t = -4.046, df = 50, p < .001$; father: $t = -4.612, df = 47, p < .001$); they were also less trusting that parents would understand their needs and desires at post-treatment (mother: $t = -3.322, df = 50, p < .002$; father: $t = -3.418, df = 47, p = .02$). There were no differences at post-treatment regarding attachment to peers. No effect sizes were reported.
Interestingly, the researchers also analysed the effects of age, diagnoses and gender for outcomes following intervention; independent sample t-tests were completed comparing 13–15-year-olds to 16–17-year-olds. There were significant changes in the anger dysregulation scale of the AUAQ for 16–17-year-olds, but not for 14–15-year-olds (t = 2.16, df = 51, p = .04). As measured by the AAQ, younger adolescents were more empathetic than older adolescents towards parents by the end of treatment, according to the goal-corrected partnership subscale (t = 2.33, df = 53, p = .02). Additionally, on the AAQ, younger adolescents perceived a greater attachment insecurity than older adolescents by the end of treatment (t = 2.61, df = 53, p = .01). Regarding specific presenting problems, adolescents with substance abuse problems had increased anger towards peers, as per the IPPA, whilst those without substance abuse issues reported increased emotional connection with peers (t = −2.70, df = 45, p = .010). Adolescents with this presenting problem also perceived their mothers as less understanding of their needs and desires than peers without this problem (t = −2.158, df = 50, p = .036). For adolescents without depression, there was a greater decrease on the dysregulation subscale of the AUAQ, than adolescents with depression, whereas adolescents with depression reported increased perception of lack of care from parents by the end of treatment (t = −3.511, df = 51, p = .002). On the fear subscale, adolescents without depression became less fearful of caregivers’ inability to care for them than those with depression t = −2.180, df = 51, p = .043). On the IPPA father trust subscale, adolescents with depression perceived fathers as less understanding and respecting of their needs and desires at the end of treatment compared with those without (t = −2.023, df = 47, p = .033). This study highlights the importance of utilising multiple measures of attachment, or rather choosing the specific aspect of attachment of interest, with a corresponding measure (Bosmans & Kerns, 2015; Jewell et al., 2019). It further suggests that attachment as measured by different dimensions, may follow a different course following treatment, within different age groups and presenting problems. In this study, the number of participants in each age group compared were not reported, nor was the number of participants approached with the convenience sampling methodology used or the number of participants partaking in the full intervention.

**Association between change in attachment and mental health outcomes.** Regarding the second research question, appropriate statistical analyses are required, such as mediation analyses, to understand the direction of any associated outcomes of attachment and mental health or psychosocial problems. Six studies in total employed analyses which were appropriate to this research question (2, 9, 11, 12, 14, 19). Both Moretti et al. (2015) and Barone et al. (2019) analysed the effects of the Connect treatment on attachment and associated changes in internalizing and externalizing behavioural problems. Barone et al. (2019) conducted two double mediation models,
which revealed that mothers who participated in the Connect program reported fewer internalizing and externalizing problems at the third time point (four months follow-up), after a decrease in attachment anxiety and avoidance, at time point two. Importantly, this direction was unique, as reductions in anxious attachment did not mediate reductions in externalising problems, and reductions in avoidant attachment did not lead to reductions in internalizing problems. Convincingly, the inclusion of mothers’ and adolescents’ reports in the models confirmed the same pathways found in the same study.

Moretti et al. (2015) found similar and specific pathways as Barone et al. (2019); reductions in attachment avoidance were associated with lower levels of youth post-treatment externalizing symptoms ($\Delta R^2 = .04; \beta = .20, F(1, 539) = 332.85, p < .001$). Reductions in attachment avoidance were also associated with lower levels of post-treatment internalizing symptoms ($\Delta R^2 = .01; \beta = .09; F(1, 539) = 306.78, p < .001$). Controlling for pre-treatment symptoms, reductions in attachment anxiety were associated with lower levels of post-treatment internalizing symptoms ($\Delta R^2 = .05; \beta = .22; F(1, 539) = 360.28, p < .001$). Reductions in attachment anxiety were associated to lower levels of post-treatment externalizing symptoms ($\Delta R^2 = .01; \beta = .07; F(1, 539) = 292.14, p < .05$), The unique contributions of attachment anxiety and avoidance, as well affect regulation, were blocked together in a final model. Controlling for pre-treatment symptoms, reductions in attachment avoidance ($\beta = .19, p < .001$) and affect dysregulation ($\beta = .38, p < .001$), both variables were uniquely associated with lower levels of externalizing symptoms at post-treatment. Reductions in attachment anxiety were not significantly related to lower levels of post-treatment externalizing symptoms ($\beta = -.01, p = .85$). Whilst Moretti et al. (2015) included a large sample size with high levels of intervention integrity, Barone et al. (2019) employed an RCT methodology to reduce bias. Although both studies did not report on blinding procedures, the similar findings support the specific pathway found.

In another RCT, Rimane et al. (2022) found that for change in trauma symptoms (total CAPS-CA score), interactions of change in attachment anxiety and attachment avoidance with time were significant. With the CAPS-CA intrusion and avoidance subscales, the interaction between AR avoidance and time reached significance. Furthermore, by examining the slopes, the authors found that a reduction in attachment security over time led to lower PTSS scores at post-treatment, three-month and six-month follow-up. Gunlicks et al. (2019) also measured attachment along the avoidant and anxious dimensions with the ECR-R (Brennan, Clark, & Shaver, 1998). Decreases in ECR-R anxiety and avoidance were each related to a decrease in CDRS-R over time, after controlling for medication status [anxiety, estimate = 5.47, SE = 1.05, F(1,30) = 26.93, p < .001; Avoidance [estimate = 5.55, SE = 1.14, F(1,29) = 23.89, p < .001]. In another study of the same trial, Zhou et al. (2021) used the
same analytic method and found that the decrease in ECR-R Anxiety and Avoidance over time was significantly associated with the decrease in both dimensions of DAS (Weissman & Beck, 1978) over time, controlling for depression.

Concerning the outcome of self-harm, Russouw & Fonagy (2012) also used the ECR-R (Brennan, Clark & Shaver, 1998) as an outcome measure. A mediation analysis with multiple linear regression revealed that significant reductions in ECR-R avoidance uniquely led to significant reductions in self-harm ($\beta = 0.62, t(58) = 3.88, p < .001$). Importantly, once changes in the HIF total score and ECR avoidant scores were controlled for, the effect of MBT-A on self-harm was no longer significant.

Overall, the studies investigating unique contributions of changes in attachment reveal specific pathways of improvement in anxiety and avoidance security dimensions leading to reductions in internalizing and externalising behavioural problems, depressive symptoms, and self-harm. Several trials utilised the same measures and RCT methodology, increasing confidence in findings. However, sample sizes were relatively small, except for Moretti et al. (2015), which was an uncontrolled trial. However, the RCT by Barone et al. (2019) found similar findings of unique pathways of changes in attachment to behaviour outcomes, supporting reliability of the results.

**Discussion**

This review aimed to synthesise and critically evaluate the available research assessing change in attachment following psychological treatment for adolescents. This review included five studies utilising an attachment theory-based treatment and 12 studies which used various non-attachment focussed treatments: these included IPT-A, Family-Based Treatment, Cognitive Processing Therapy, Analytic Psychotherapy, Scene-Based Psychodramatic Family Therapy, Mentalisation-Based Treatment for Adolescents, Psychoeducation, Animal-Assisted Therapy, Music Therapy and Wilderness Therapy. In five of the six studies with an attachment-focussed treatment, an improvement was found in terms of attachment security and reductions in attachment avoidance and attachment anxiety. All these studies measured and conceptualised attachment with self-report methods and along dimensions, although utilised different measures with correspondingly different components of attachment. An exception was found with Barone et al. (2019) and Moretti et al. (2015), which assessed attachment according to attachment avoidance and attachment anxiety, with measures based on the ECR-R (Brennan et al., 2011), and found similar and specific results between different methodologies and number of participants, with the same intervention. The studies assessed as having ‘Moderate’ or ‘Strong’ methodological quality all reported significant improvements in attachment security (or reductions in attachment insecurity).
Another characteristic of these studies was the representative samples, since adolescents and parents were recruited systematically from ongoing referrals within clinics or hospitals. Diamond et al. (2013) was rated as ‘Strong’ in methodological quality and found significant differences between the treatment and control group only when completer analysis was utilised on this small sample.

The attachment focussed treatments shared many characteristics of hypothesised ideal components outlined by Kobak et al. (2015); these components included targeting adolescent and caregiver IWMs and addressing unhelpful communication patterns, through i) implicit modelling of secure attachment, ii) emotional processing of attachment narratives, iii) reflective dialogue and iv) psychoeducation. Interventions varied in the extent to which they included these components, with some several studies including novel attachment-focussed interventions, such as BRAVA (Cloutier et al., 2021).

These reviewed studies found significant improvements in additional outcomes, including depression, academic procrastination and intolerance of uncertainty, suicidal ideation, physical health symptoms, general health, and internalizing and externalizing behaviour problems. However, only Moretti et al. (2015) and Barone et al. (2019) conducted necessary analyses to find that reductions in attachment anxiety and attachment avoidance uniquely led to reductions in internalizing and externalizing symptoms, respectively. This contrasts with findings from meta-analytic reviews (Groh et al., 2017) whereby change in general attachment insecurity improved outcomes. As discussed by Taylor et al. (2015), studies utilising an attachment-focussed intervention provide a clearer picture in terms of the causal link between changes in attachment security (or insecurity) and psychopathology symptoms, in the absence of appropriate analyses.

Regarding studies which used other theoretically driven psychological treatments, 10 of the 13 studies found improvements in attachment security (or reductions in attachment insecurity). All studies used self-report measures and conceptualised attachment according to various dimensions, depending on the measure(s) used; one study used an additional interview method (Stefini et al., 2013), which corroborated the improvements in attachment security via self-report following analytic psychotherapy. Three studies, describing two trials (Bettman & Tucker, 2011; Wallis et al., 2017a; Wallis et al., 2017b) described a reduction in attachment security following post-treatment, apart from alienation towards mothers, which improved, and attachment to peers, which was unchanged. Importantly, Wallis et al. (2017a;2017b) included a non-clinical control group for comparison and Bettman and Tucker (2011) included no control group. Therefore, it is unclear if attachment may have naturally declined for these adolescents over time, and therefore if a lack of change in attachment may have been a clinically meaningful result, when compared to a matched
control group. To illustrate this, Maya et al. (2020) found that attachment security reduced for the control group, but not the treatment group. Although the age of participants was similar between these studies, it is difficult to compare them due to the range of presenting problems; Bettman & Tucker (2011) included adolescents with specific child-parent relational problems, oppositional defiant disorder (ODD), and substance misuse, referred to the residential program by their parents. Research suggests that longer-term relationships, such as with parents, tend to be more stable and less amenable to change than those with peers during adolescence, and certain presentations such as ODD are strongly linked with disorganised attachment (Fraley et al., 2011; Theule et al., 2016; Bowlby, 1973). Such factors may require more intense attachment specific treatments if a change in attachment is a therapeutic goal.

Improvements in attachment security were found across different therapy formats, including group, individual therapy, or a mix of both, across various therapy lengths, number of sessions and settings. Studies including follow-up assessments also found improvements to be maintained or improved beyond post-treatment, as shown by Barone et al. (2019) and Rimane et al., (2021; 2022).

Importantly, the results of studies included in this review are subject to the conceptual issues when measuring attachment, which is also found across the literature. The developmental stages of middle childhood and adolescence are lacking a ‘gold-standard’ approach to measuring attachment (Bosmans & Kerns, 2015). Furthermore, attachment is continually changing across childhood and adolescence, since the attachment system may serve different functions as a child develops rapidly in these years, with processes such as formal operational thinking and direction of attachment to peers or romantic partners (Inhelder & Piaget, 1958; Fraley, 2019). In this way, attachment patterns over this time may become hierarchical, including peers and parents, and can be thought about abstractly. Interview measures such as the Adult Attachment Interview (AAI; Main & Kaplan, 1985) and the Child Attachment Interview (Target et al., 2003), as well as observational methods such as the ‘Strange Situation’ paradigm (Ainsworth et al., 1978), organise attachment patterns into categories, and may offer more meaningful and stable measurement following psychotherapeutic interventions, or across time. These categories are organised as A, B, C and later D (Main & Solomon, 1986), corresponding to insecure-avoidant, secure, insecure-ambivalent and disorganised, for infants and children, and secure, dismissing, preoccupied and disorganized for adults. An individual’s responses are coded by trained professionals and an attachment category is assigned to them.

A review by the National Institute for Health and Care Excellence (2015) recommended that the CAI should be used for middle childhood, whereas the AAI should be used for adolescents aged over 15 years. These interview methods are semi-structured, meaning that trained clinicians can divert from
the set questions can be followed-up on and key information can be included, such as coherence of reports. Despite the semi-structured nature of the interviews, agreement rates are consistently greater than $r = .75$ and category agreements are found to be 90% or greater (Steele et al., 2009). These interview methods assess the current state of mind regarding attachment, based on probable past experiences with attachment figures and the individual’s meaning around this. Interviews and coding by professionals can therefore account for defensiveness or other key psychological variables which may be inherent with attachment styles, such as avoidant attachment.

As found in this review, the intervention studies all measured attachment via self-report methods and often according to the dimensions of attachment avoidance and attachment anxiety. With these methods an individual may fall along both scales from insecurely attached to securely attached, meaning that they could also fall within the middle of the scales, between securely attached and insecurely attached. In this way, conceptually, attempting to reduce attachment anxiety or avoidance strategies simultaneously increases attachment security. On the other hand, the interview and categorical methods operationalise attachment security and insecurity as separate constructs. Conceptually, this would correspond to altering negative self and other IWM (reducing insecure attachment) and fostering positive self and other IWM, allowing support-seeking and reliance on others for support (increase secure attachment; Kobak, 2015). Such a method may also be more applicable to meaningfully measure change within psychotherapeutic settings (Steele et al., 2009), as analyses such as odds ratios can be conducted, measuring overall change from one category to another, such as avoidant attachment to secure attachment. Having said this, interview methods often do not categorise individuals into a single attachment category due to coded responses being clustered in several categories. Individuals are then subsequently placed into an ‘unresolved’ category for purposes of statistical analyses (Steele et al., 2009; Main et al., 2008). Nonetheless, odds ratios of change from this category to secure attachment may represent more meaningful intervention effects, less effected by confounding variables which may affect attachment responses on self-report measures over short periods of time.

Limitations

Although many of these studies included strong methodological designs, being RCTs, they often included non-active control groups or failed to control for confounders, such as baseline differences in outcomes. Additionally, withdrawals and drop-outs were often not reported. This makes the clinical effectiveness of the treatments difficult to gauge. This is also the case for intervention integrity, which was not included in overall quality assessments, as per the EPHPP guidelines. However, without intervention integrity measured, it is difficult to consider which components of
treatments are particularly effective for changing attachment and the causal relationships with outcomes (Power et al., 2005).

Further, most studies included participants who were self-referred or recruited in studies through non-systematic means. Selection bias may therefore reduce applicability to target populations in clinical practice. Nonetheless, for those designs which accounted for these methodological issues, improvements were found in attachment.

Another limitation was the varied use of measures between studies. The IPPA (Armsden and Greenberg, 1987) and ECR-R (Brenning et al., 2011) were used by most studies, and have been found to be of the most valid and reliable measures in adolescent populations (Jewell et al., 2019). On the contrary, they have inadequate structural validity and variations even within these measures were used. This means that findings between studies are difficult to synthesise. However, one study revealed through discriminant function analyses that the IPPA can be conceptualised along two dimensions (with low scores in attachment avoidance and attachment anxiety constituting high attachment security), as with the ECR-R, making comparison possible (Vivona, 2000). The dimensional approach has also been identified as favourable in terms of reliability and structural validity (Jewell et al. 2019). For these comparisons, however, specific scores on items of the measures would need to be calculated, which were often not reported. Such difficulties in measurement may be related to the measurement of attachment as a construct and the fluidity of attachment during adolescence (Jones et al., 2018; Jewell et al., 2019).

**Clinical Implications and Future Research**

Attachment security or insecurity has been repeatedly shown to be associated with key health outcomes, including a myriad of psychopathology disorders from depression and anxiety to psychosis and PTSD during adolescence (Malik et al., 2015; Brumariu & Kerns, 2010; Gumley et al., 2014; Woodhouse et al., 2015). Positive changes in attachment security and insecurity are therefore key transdiagnostic targets for alleviating psychological distress and lifelong well-being outcomes. This review has highlighted several studies which have shown direct causal pathways from reductions in attachment insecurity, or increases in attachment security, and improvements in psychopathology symptoms. Future research would benefit from matching attachment and other outcome measures to targeted components of attachment and psychopathology during treatment. For example, targeting hypothesised changes in adolescent and caregiver IWMs and communication will require corresponding attachment measures and theoretically linked outcomes. Kobak et al. (2015) argued that intensive longitudinal and repeated assessments may be required to capture the subtle components of attachment representations, such as parents’ narrative descriptions of
adolescents, if this is a treatment target. Such methodologies may provide an alternative to capturing the complexity of adolescent attachment, which can be particularly fluid and context-dependent (Fraley et al., 2019).

Furthermore, research which includes additional measures which may account for mechanisms or mediators of change will advance the field considerably. Theoretical models exist and point to emotion regulation as one key variable amongst others (Mikulincer & Shaver, 2019). Utilising appropriate and theoretically associated measures will therefore help refine attachment interventions and further attachment theory.

Conclusions

This review has provided evidence that attachment during adolescence is amenable to change following various modalities of psychological treatment. Several studies identified a casual role of change in attachment to improvement in psychopathology. Replication of studies using larger sample sizes with sufficient power and RCT methodology with active treatment-control groups and appropriate statistical analysis to account for mechanisms of change will advance the literature considerably. Current attachment measures have limited shared conceptualisation of attachment as a construct and clinical utility of findings.
References


The Attachment Theory of Emotion Regulation in Clinical and Non-Clinical Adolescents: An Experience Sampling Methodology Study

Jordan Anthony Bibby

Address for correspondence: 

Key words: Attachment, adolescence, emotion regulation, experience sampling methodology, clinical, affect.

Highlights:

- Attachment styles and emotion regulation did not predict global anxiety, global depression or daily affect when measured cross-sectionally.
- A latent variable combining attachment styles and momentary attachment, measured via experience sampling methodology, predicted emotion regulation and daily negative and positive affect.
Abstract

Introduction: The attachment theory of emotion regulation posits that the attachment dimensions of avoidance and anxiety lead to differences in emotion regulation abilities, which then impacts experience of negative and positive affect and the developmental of mental well-being. This theory is most applicable to the developmental stage of adolescence when attachment is particularly susceptible to change and when mental health disorders have the highest incidence rates. Previous studies have supported the hypotheses of this theory; however, few studies have measured attachment or experience of emotions within real-time and embedded within daily life.

Methodology: This study employed cross-sectional and experience sampling methodologies to investigate the attachment theory of emotion regulation in 25 adolescents attending specialist mental health services and mainstream schools. Firstly, the associations between the attachment dimensions of avoidance and anxiety, emotion regulation and global anxiety and depression were measured cross-sectionally. Secondly, attachment and daily negative and positive affect were measured using experience sampling methodology over a period of one week, several times a day. The associations between a latent variable of attachment, combining momentary attachment and baseline attachment dimensions, emotion regulation and daily negative and positive affect were then assessed.

Results: Multiple regression analyses revealed that the attachment dimensions did not predict emotion regulation or global levels of anxiety or depression, nor daily negative or positive affect. However, when momentary attachment was added within a latent variable, lower attachment security predicted emotion regulation and increased daily negative affect. Emotion regulation acted as a mediator within this relationship. On the other hand, attachment was not associated with daily positive affect, whereas emotion regulation was. Attachment and emotion regulation shared covariance in predicting increased daily positive affect.

Conclusion: Attachment dimensions were not associated with emotion regulation and indicators of mental health and daily experience of emotions when measured cross-sectionally. However, when attachment was measured via ESM, results supported the attachment theory of emotion regulation. Additionally, this study highlights the validity of ESM when assessing attachment during within real-life contexts.
Introduction

Attachment theory explains that a human’s understanding of themselves, how they relate to others, and the organisation of their social world, can be traced to the biologically innate attachment behavioural system (Bowlby, 1969; Bowlby, 1982). A fundamental premise of the theory is that the quality of caregiving during early development leads to stable individual differences in the security of attachment styles, which are patterns of interacting and relating to others (Hazan & Shaver, 1987). Attachment styles which are higher in security are associated with more adaptive regulation of emotions, ability to seek support during times of need, and higher self-efficacy and self-esteem (Bowlby, 1973; Shaver et al., 1996; Brumariu, 2015; Mikulincer & Shaver, 2019; Fraley & Roisman, 2019). Despite these well-established associations, underlying mechanisms within real-life contexts are not well understood, ignoring a second fundamental premise, that attachment cognitions and behaviours are activated in response to ‘person-by-situation’ interactions (Simpson & Winterheld, 2012; Fraley, 2019). These conceptual issues are most profound for the developmental period of adolescence during which attachment is understood to be most unstable (Jones et al., 2018; Jewell et al. 2019). Pertinently, prevalence rates of depression and anxiety symptoms have doubled in recent years during adolescence, with few changes in mental health treatments (Racine et al., 2021; Mojtabai et al., 2016). Evidence suggests individual differences in attachment precedes the development of such symptoms (Spruit et al., 2020). Thus, better understanding of the contextual mechanisms of attachment in psychopathology could inform transdiagnostic treatment during this critical period and advance attachment theory considerably. With the recent development of technology and methodology, such as with experience sampling methodology (ESM), these investigations are possible.

Attachment Conceptual and Measurement Issues

A conceptual issue that has not been resolved within attachment research, is that whilst attachment styles are posited to be stable, the attachment system is understood to activate during times of distress to achieve equilibrium and a sense of security (Bowlby, 1982; Ainsworth, 1979; Fraley, 2019). Thus, attachment styles are trait-like-states, although have not often been measured as such across developmental periods, with good reason (Fraley, 2007; Verhees et al., 2020). Repeated interactions with a caregiver during early years is understood to shape the security of the attachment behavioural system and leads to stable patterns of interacting with others in later life. Thus, attachment becomes internalised over time based on these interactions. High attachment security, representing confidence that close others will be available and responsive to one’s needs, is
more likely to develop when these repeated interactions involve warmth, availability and responsiveness. Attachment insecurity reflects the inverse of this (Gollath et al., 2016). These internalised interactions will then shape how and when the attachment system will activate on a moment-by-moment basis throughout life (Gollath et al., 2016).

Correspondingly, during the first four years of life when attachments are not yet internalised, the security of attachment bonds is observed through direct behaviours following a live stressor. This may involve the separation from a caregiver (usually the mother) within laboratory settings, as is the case with the ‘strange situation’ paradigm (Ainsworth, 1979; Ainsworth et al., 2015; Bosmand & Kerns, 2015). Through to adolescence and adulthood, attachment styles involve patterns of behaviours and cognitive representations of the self and others, referred to as ‘internalised working models’ (IWM). However, it is usually only cognitions, within the social psychology discipline, which are primarily measured cross-sectionally by self-report methods (Ravitz et al., 2010; Jewell et al., 2019).

Multiple meta-analyses of such cross-sectional and longitudinal studies have found insecure attachment to be associated with global internalizing and externalizing symptoms, with inconsistent results of small to moderate effect sizes, in favour of cross-sectional studies (Groh et al., 2012; r = .07, Madigan et al., 2013; r = .18, Groh et al., 2017; d = .58). Inconsistency in findings may reflect evidence that attachment styles can change following common life events such as parental divorce (Jones et al., 2018), improved relationships or conflicts with parents and peers (Fraley et al., 2013; Arriaga et al., 2014), and therapy (Taylor et al., 2015), resulting in smaller effect sizes for longitudinal studies and possible over-inflation of cross-sectional studies (Spruit et al., 2019). Such evidence supports the revisionist model of attachment, which states that IWM can be updated according to life events and even repeated daily interactions with close others (Fraley, 2002; Arriaga 2018).

Since the attachment system interacts with a person’s current life situation, the arbitrary moment of measurement may affect the found relationships between variables. To example this, Girme et al. (2018) conducted four interviews per adult participant, at four-month intervals over one year, and calculated within person standard deviations in attachment. They found individuals experienced high levels of variation in relationship specific attachment, whilst higher attachment security led to more stable attachment. However, those higher in attachment security also experienced higher relationship distress when attachment fluctuated over this period.

Having said this, these associations within cross-sectional studies become more consistent when specific disorders or symptoms thereof, such as anxiety and depression, or specific emotions (Brenning & Braet, 2013), are the subject of investigation in studies (Dagan et al., 2018). Specifying
constructs even further can increase validity, as recent meta-analyses show that the types of attachment insecurity uniquely moderate the association with depression (Marganska et al., 2013; Spruit et al., 2019; Zheng et al., 2020) and anxiety disorders (Marganska et al., 2013; Groh et al. 2017; Van Leeuwen et al., 2020) in adolescent and adult populations. Therefore, broadly categorizing individuals as ‘insecure’ vs ‘secure’ can reduce explained variance and lead to type II errors.

These specific types of attachment styles are understood to manifest according to two underlying attachment dimensions, namely attachment avoidance and attachment anxiety (Bartholomew & Horowtiz, 1991; Brennan et al., 1998). Whilst attachment anxiety reflects a) expectations of separation and preoccupation with the availability and responsiveness of close others, and b) negative views of the self, low confidence in one’s ability to manage challenges and concerns of being valued by others; attachment avoidance reflects a) possible over-inflation of one’s ability in order to negate reliance on others, and b) avoidance of intimacy and negative views of others’ dependability and intentions (Fraley & Waller, 1998). Where an individual falls on these two dimensions predicts which of the four prototypical attachment styles they will display across situations (see Figure 2); either secure (low in attachment avoidance, low in attachment anxiety), preoccupied (high anxiety and low avoidance), dismissive (high in avoidance and low in anxiety), or fearful (high in anxiety and high in avoidance; Brennan et al., 1998).

Figure 2. Attachment dimensions and theoretical prototypes. Adapted from Dugan et al. (2022).
Clear models have been outlined to explain how each attachment style is associated with distinct mental health problems such as anxiety and depression, with a mediating role of emotion regulation (Mikulincer & Shaver, 2012; Mikulincer & Shaver, 2019; Brumariu, 2015). Indeed, evidence from one systematic review on studies using dynamic longitudinal measures, indicates that the very experience of emotions during childhood, operationalised as reactivity of emotions and reduction of emotion intensity to baseline over time, is associated with distinct attachment patterns with parents (Obeldobel et al., 2023); whilst secure attachment was associated with faster emotion recovery and lower reactivity, avoidant attachment was associated with low emotion reactivity and recovery, suggesting dampened but prolonged emotions. Contrastingly, anxious attachment was associated with greater emotion reactivity but not recovery. In explaining the differential experience of emotions between attachment styles during childhood, Brumariu (2015) and Eisenberg et al. (1998) suggest that secure attachment sets the stage for the socialization of emotions, as they are directly taught and mirrored to a child, and safety is given in their expression within the attachment bond.

**Attachment Theory of Emotion Regulation**

Importantly, good mental health is not the result of experiencing overall more positive emotions than negative (Trull et al., 2015). Emotions can be helpful or harmful, depending on different contexts (Gross, 2015); emotions may be helpful when they guide decisions and provide information on the best course of actions (Simon, 1967; Schwarz & Clore, 1983). For example, one may attempt to reduce positive affect if their friend describes a difficult day, to show their sympathy, or one may increase their anxiety if they are completing a task with a soon deadline. Emotion regulation then, can be understood as the ability to monitor, evaluate and modulate emotions in order to reach one's goals (Thompson, 1994; Eisenberg & Spinrad, 2004). Further, the goal can include the reduction of emotion as a mean and end, i.e., a person may attempt to reduce the experience of anxiety because they do not want to feel anxious (Gross et al., 2011). Some authors argue that the constructs of emotion regulation and experience of emotion cannot be separated, as both occur simultaneously (Campos et al., 2004; Gross, 2014).

As with the attachment behavioural system, emotion regulation can be dynamic and context dependent, according to the extended process model of emotion regulation (Gross, 2015). Within this model, emotion regulation can be understood as a top-down process. Firstly, this involves identification and direction of attention to an emotion; secondly, a selection of regulatory responses is required, dependent on the intensity of the emotion and current cognitive and physiological resources; and thirdly, the general selection of regulatory strategies is fine-tuned to the specific
Other authors have argued that emotion regulation can be a bottom-up process requiring only the registration of sensory inputs (Mauss et al., 2007a; Mauss et al., 2007b; Myruski et al., 2019), which may begin with effortful control but over time becomes automatic, as with other skills (Ashby et al., 2007).

Regardless of these posited processes, within the literature, emotion regulation strategies can include cognitive reappraisal, affect suppression, rumination, and withdrawal or avoidance. Different strategies are often divided according to whether they are ‘adaptive’ or ‘maladaptive’, due to correlations between measures and psychopathology symptoms, following confirmatory factor analysis studies (Garnefski & Kraaj, 2006; Jermann et al., 2006). Naragon-Gainey et al. (2017) conducted a meta-analysis of such confirmatory factor analysis studies and found no previous model, which categorised emotion regulation strategies, fitted the data. However, using network analysis, which allows for examining probabilistic associations between items and identification of data structures despite high correlations, Suwurtano & Bintamur (2019) found evidence that underlying factors are split between cognitive reappraisal and emotion suppression. Cognitive reappraisal has been positively associated with better psychological health (Haga, et al., 2009; Cabello et al., 2013), whilst avoidance and emotion suppression has been linked to stress-related symptoms (Lougheed & Hollestein, 2012). However, one study using daily diary methods compared strategy use between age ranges and found that cognitive reappraisal increases negative affect for adolescents aged 17-19 years but was associated with decreased negative affect over increasing age (Brockman et al., 2016). Such evidence suggests that emotion regulation cannot be deconstructed from real-life contexts or from within individuals when considering their utility and association with psychological health variables (Aldao, 2013).

Attachment theory can be applied at each step of the above models, to further explain individual differences in emotion regulation ability across contexts. One meta-analysis of 10 studies, including 564 children aged 1-12 years, revealed that greater attachment security is associated with greater emotion understanding, with a medium effect size and no moderating factors such as age (Cooke et al., 2016). It is important to note that these studies used cross-sectional methods of emotion understanding. However, one longitudinal study, whereby infant-mother attachment was measured according to the strange situation paradigm for infants aged 1 year, showed that greater attachment security is associated with more accurate verbal labelling of simple and complex emotions through drawn caricatures at ages 6 and 11 years (Steele et al., 2008). Interestingly, avoidantly attached children were relatively better at recognising happy faces than anxiously attached children. Both insecure attachment styles were associated with poor recognition of more complex emotions such as mischief and surprise, compared to those with secure attachment.
The authors concluded that these patterns of ability depend upon earlier experiences with caregivers, and whether specific emotion understanding would be adaptive. For example, recognising happy emotions for avoidantly attached individuals, rather than negative emotions, may lead to increased responsiveness from caregivers and less reliance for support (Brumariu, 2015). These studies highlight that the identification and recognition of emotions may be shaped by attachments early in development.

For the next stage, selecting an emotion regulation strategy, consciously or unconsciously, will depend on the repertoire an individual has learnt (Gross, 2015). Mikulincer and Shaver (2016;2019) argue that the repertoire an individual has, will depend on what they have learnt is effective within attachment relationships and the responses from caregivers to their emotional needs. Individuals who are avoidantly attached use strategies which are ‘deactivating’, meaning emotional experience, especially of unpleasant valence, is suppressed to avoid attachment related needs (Gillath et al., 2016). On the other hand, anxiously attached individuals are understood to use ‘hyperactivating’ strategies, which include rumination and exaggeration of negative affect and distress, to elicit support from attachment bonds (Gillath et al., 2016).

A meta-analytic review, including 72 studies with children and young people aged under 18 years, partially supported these hypotheses (Cooke et al., 2018). This review separated defined constructs of emotion regulation between studies, as well as experienced emotion, to evaluate how differences in operationalisation could moderate relationships with attachment styles. For example, experienced emotion was separated between studies that measured this via global cross-sectional measures, or using elicited emotion measures during social interactions, via daily reports or within laboratory settings. It was found that securely attached children were better at regulating their emotions, experienced less global and elicited negative affect, were more likely to use cognitive emotion regulation skills and relied on others for support more readily than insecurely attached children. Avoidantly attached children were less likely to use cognitive strategies or social support strategies and experienced less positive affect. Importantly, this meta-analysis found no relationship between avoidance-based coping strategies for avoidantly attached children. Also, avoidantly attached children did not show differences to securely attached children when elicited measures of emotion were used. Anxiously attached children experienced more negative affect and were poorer at regulating emotions than securely attached children, although did not show differences in the use of coping strategies compared to children with secure attachment. These findings provide conflicting evidence for the attachment theory of emotion regulation, which was partly accounted for by methodological design.
However, there was large heterogeneity in effect sizes between studies and the analysis could not consistently examine the moderating role of types of measures used for eliciting emotion or emotion regulation. Importantly, there is a large discrepancy in ecological validity between studies which measure emotion in real-life contexts or in laboratory settings (Aldoa, 2013) but these studies were not separated under the operationalisation of elicited emotion. Nonetheless, evidence from this review suggests that experimental findings on the attachment theory of emotion regulation can vary when emotion regulation is measured within real-life social interactions and may account for the heterogeneity within the literature base.

Micro-level changes in emotion over time and in relation to wider transdiagnostic factors may be best equipped to predict risk of psychopathology and its prevention (Wichers, 2014; Nelson et al., 2017). More recently, the uses of ESM to capture context-dependent constructs, such as experienced emotions, has increased exponentially (Myin-Germeys et al., 2018).

ESM and the Attachment Theory of Emotion Regulation in Adolescence

ESM is a structured self-report diary technique, usually requiring participants to respond to brief questionnaires several times a day, over a longitudinal period, during their daily lives. Rooted in ecological psychology, this type of measurement examines behaviour within the context in which it occurs (Myin-Germeys et al., 2018). ESM overcomes recall bias and allows investigation of temporal associations between variables. Constructs which have traditionally been understood as stable traits, such as personality (Barrick & Mount, 1991), have been shown via ESM to vary more within persons, across time and situations, than between persons (Fleeson & Law, 2015).

As discussed, attachment and emotion regulation are two constructs which have been theorised as encompassing trait and state aspects. To date, four studies have investigated the association between attachment styles and daily measures of experienced emotions, amongst other variables. Sheinbaum et al. (2015) recruited a Spanish sample of 206 healthy undergraduate students and measured attachment at baseline using the ‘Attachment Style Interview’ (Bifulco et al., 2002), to consider the impact of attachment style on daily affective states, appraisals and social functioning. Daily ESM data was collected via palm pilot devices over a period of one week. They found that those classified as anxiously attached showed higher mean levels of negative affect, stress and perceived social rejection than those classified as securely attached. Also, individuals classified as avoidantly attached showed no difference in mean levels of negative affect compared to securely attached individuals, but showed lower levels of positive affect, and decreased desire to be with others when alone. It was concluded that such findings support the theory that anxiously attached individuals utilise hyperactivating strategies, whilst avoidantly attached individuals rely on
deactivating strategies. Interestingly, social contact had benefits in terms of increased positive affect and more positive appraisals about one’s current situation for all participants. However, attachment style moderated the effect of perceived social closeness on daily life experiences. Compared to securely attached individuals, anxiously attached individuals reported more negative and less positive experiences when they were with others whom they were not close to and avoidantly attached individuals felt less cared for by others as closeness decreased.

In another study, Dancik et al. (2021) utilised the Experiences in Close Relationships Questionnaire – Revised, Slovakian version (ECR-RS; Fraley, 2000; Bieščad & Hašto, 2010), to measure attachment styles at baseline and associated effects on daily reports of positive and negative affect, stress and perceived closeness, over 6 days. In a sample of 44 self-selected adults who reported never to have experienced mental health problems, those with higher attachment related anxiety experienced higher scores of negative affect and stress. Whilst higher attachment avoidance was not associated with higher negative affect or stress, it was associated with lower perceived closeness of company, regardless of the specific relationship, and lower positive affect when in social company. Again, Dugan et al. (2022) recruited adult undergraduate students and investigated the impact of avoidant attachment style on daily measures of subjective well-being, including negative and positive affect. Participants also completed the ECR-RS (Fraley, 2000) during a laboratory session followed by 7 days of four ESM measurements per day. The prototypical attachment styles were conceptualised according to where individuals fell on the two attachment dimensions. Similar to the previous studies, attachment anxiety was positively associated with higher negative affect whereas there was no association between avoidance and negative affect. Again, being around others was associated with lower negative affect for those low in attachment avoidance, whereas this effect was weaker for those high in attachment avoidance. Attachment avoidance was also negatively associated with positive affect, whereas attachment anxiety was not. These findings suggest that avoidant attachment is associated with lesser benefits from social contacts, and lower levels of positive affect, suggesting a dampened socioemotional experience during daily life.

These studies all used baseline measures of attachment and provide evidence that attachment styles contribute meaningfully to daily levels of affect as measured by ESM, and that these relationships vary according to social contextual factors. Overall, the findings provide support for the attachment theory of emotion regulation, in that those with attachment anxiety rely on hyperactivating strategies, whilst avoidant attachment is associated with deactivating strategies. However, these studies included only healthy adults, for which attachment styles may interact with daily life differently, compared to those from clinical samples. For example, those struggling with mental health problems may encounter more stressful social interactions during daily life, activating the
attachment system more regularly, and leading to differences in emotion regulation (Kuruvilla & Jacob, 2007). Indeed, Sitko et al. (2016) showed, in a sample of 20 adults with psychosis-spectrum diagnoses and 20 adults without psychosis, that attachment insecurity was higher and varied more so day-by-day in the clinical population. Importantly, attachment was measured via a baseline measure as well as several ESM items. Elevated stress predicted attachment insecurity, whilst increased attachment insecurity led to an increase in paranoia, even after controlling for self-esteem. This study shows that attachment is activated following contextual stress and that such fluctuations contribute to psychopathology symptoms, moment-by-moment.

Although these studies contribute meaningfully to the attachment theory of emotion regulation, specific measures of emotion regulation were not included within the studies, limiting understanding of mechanisms. Furthermore, no study has yet investigated the attachment theory of emotion regulation during the daily lives of adolescents. ESM is most applicable within this age range, which presents as a ‘second critical period’ in terms of vulnerability for psychopathology and lifelong outcomes (Abela & Hankin, 2008; Nelson et al., 2005; Blakemore & Mills, 2014). ESM has been shown to be feasible within this population, even within secondary school contexts when responses to questionnaires could be hypothesised as limited (Mölsä et al., 2022). Attachment has been evidenced as particularly unstable during adolescence (Jones et al., 2018), which may be linked to the turbulent relationships, increased intensity and fluctuations in emotions, lagged development of brain areas implicated in emotion regulation such as the prefrontal cortex, and independence from parents (Koopke, & Denissen, 2012; Seiffge-Krenke, 2013; Skinner & Wellborn, 2019; Foulkes & Blakemore, 2018). These events are stressful and as such may activate the attachment system frequently or differentially from adult populations, whilst attachment styles are yet to be internalised. Additionally, increased stress requires increased regulation of emotion, yet evidence highlights differential usefulness of strategies, such as cognitive reappraisal, within this age group compared to adults (Verzeletti et al., 2016).

**Overview of the Present Study**

This study aimed to investigate the attachment theory of emotion regulation, using both static and ESM measures of attachment and emotion experience, to account for the stable and contextual components inherent in these variables. As discussed, ESM offers a valid approach to investigate the attachment theory of emotion regulation, as attachment behaviours and cognitions can be captured during the daily lives of individuals and across contexts, when the attachment is understood to activate. As such, attachment and experienced emotions can be captured temporally proximal to events which require emotion regulation cognitions and behaviours. Furthermore, ESM increases
ecological validity and prevents recall bias due to the measurements occurring during daily life, rather than in laboratory settings at a single and arbitrary time-point. As it has been shown that attachment may vary within persons across situations, ESM also allows assessment of between and within-person variance in attachment across time and situations due to the repeated measurement points.

Additionally, cross-sectional measures of emotion regulation and global levels of anxiety and depression were utilised. These measures of attachment styles and emotion regulation were included to understand the effects on daily experience of emotions. As noted, some authors explain that emotion regulation cannot be separated from temporally dependent experienced emotions, and as such, reports of momentary emotions over a longitudinal period can indicate the usefulness of emotion regulation strategies within daily life (Campos et al., 2004; Gross, 2014). Additionally, this study aimed to investigate how momentary attachment may contribute to the experience of momentary positive and negative emotions. As ESM allows repeated measures of variables over time, confidence can increase in prediction due to the possible temporal associations of these relationships. In line with the attachment theory of emotion regulation, it was hypothesised that: a) higher scores of anxious attachment would be associated with increased use of maladaptive emotion regulation strategies, and this would be associated with increased daily negative affect and increased daily attachment insecurity, and b) higher scores of avoidant attachment would be associated with decreased use of emotion regulation strategies in general, and this would be associated with decreased positive affect and increased daily attachment insecurity. Additionally, the interaction between the attachment styles will indicate the attachment prototype for participants in explaining the effect on emotion regulation use and daily negative and positive. Specifically, both high attachment anxiety and high attachment avoidance together (i.e., fearful prototype), will be associated with the highest levels of maladaptive emotion regulation strategies and daily negative affect, with lowest levels of daily positive affect and daily attachment.

Method

This study gained ethical approval from an NHS Research Ethics Committee (Appendix A), NHS Research and Development (Appendix B), and The Edinburgh City Council (Appendix C).

Design

This study employed an intensive longitudinal design with the use of experience sampling methodology (ESM). Participants firstly completed baseline measures followed by ESM for 7
consecutive days, with 7 brief questionnaires per day, occurring at random sampling points, within predefined blocks of 2-hour periods. These assessment points occurred during 9am-11pm.

Participants

Recruitment of participants took place within five local outpatient Child and Adolescent Mental Health Services teams (CAMHS) in NHS Lothian and two secondary school within the Edinburgh City Council. For young people presenting to CAMHS services, eligible participants for inclusion were aged 12-18 years, presenting with a mental health difficulty, were open to a CAMHS clinician and were understanding of the study. Participants were excluded if they presented with a formal diagnosis of intellectual disability. The researchers attended the CAMHS teams and provided information on the study including the eligibility criteria. Clinicians were then asked to share the provided information sheets (see appendix D) with eligible young people during their own routine appointments. Parents of young people aged 12-15 were given an information sheet also and were informed that they could opt their child out of the study at any time. Once consent was obtained from their own clinician, to share contact details with the research team, participants were contacted via telephone. During these telephone calls verbal instructions of the procedure were provided and participants could ask any questions regarding the study. Also, a unique participant identifier number was provided. If participants were still interested, they were given information to provide formal consent. Participants were informed via the information sheet and during this telephone call that they could withdraw from the study at any time without giving a reason and with no consequences for their CAMHS treatment.

For young people attending mainstream secondary schools, eligibility criteria were ages between 12-18 years and the ability to understand of the study. Exclusion criteria remained the same. All independent and private schools within the Edinburgh City Council jurisdiction were contacted via a standardised email. Information was provided on the study via information sheets and a flyer (Appendix E). Within this email, all schools were offered a tailored workshop for pupils on a range of limited topics, such as ‘technology use and mental well-being’. Head Teachers or Deputy Head Teachers of schools were invited to take part and reply to the research team if interested. Following contact from Head/Deputy Head Teachers interested in the study, a telephone or video call was attended with the research team, to organise dates and to provide the opportunity to answer any questions regarding the study. Headteachers with continued interest were provided with a consent form for themselves and for their pupils. Schools had the option to split the workshop and study participation between two lessons. This was opted for by the two schools who took part.
Materials

All data collection was obtained via electronic methods; the online survey platform ‘Qualtrics’ was used for all time invariant measures, as well as consent and demographic information. Additionally, the participants information sheets were also provided through this platform. Data relating to ESM was collected through the mobile phone application ‘M-Path Sense©’ (https://m-path.io/landing/; Mestdagh & Verdonck et al., 2022), developed by KU Leuven. Participants were offered a mobile phone for the duration of the study if they did not one. No participant requested this. An instruction brochure was created and used to help participants from the school population to understand the study procedure, due to limited time frames and researchers per pupils (please see Appendix F).

Procedure

Once participants shared interest and provided consent, a unique participant identifier number was given during the introductory telephone call. This ensured confidentiality and reduced the possibility of data being linked to identifiable information. Verbal instructions were given for all parts of the study during this phone call. Email contact was given to participants in case of required support during the study. Participants then accessed the online survey on ‘Qualtrics’ which included electronic written consent, cross-sectional questionnaires, and demographic data. For the seven days of consecutive ESM data collection, participants chose a suitable date for this to begin and a convenient notification window if the standardised notification window did not suit them. No participant requested an altered notification window. Participants then downloaded the M-Path Sense© (KU Leuven; https://m-path.io/landing/; Mestdagh & Verdonck et al., 2022) application on their mobile device and added the researcher. The week of notifications then occurred on the participant’s device, between 7am to 10:30pm, with seven notifications occurring per day. Participants could respond up to 15 minutes after a notification occurred. Participants within the clinical sample were offered the opportunity to share their data in a visual table format with a written summary, with their CAMHS clinician, to inform their treatment. Overall, five participants opted to share this data with their clinicians. A shopping voucher equivalent to £5 was paid to participants who consented to this.

Participants attending mainstream schools were visited by the researchers on the date and time chosen by their Headteacher or Deputy Headteacher. Participants were introduced to the researchers and the research study was verbally explained as well as the procedure for the lesson. Participants were given an option to engage in a separate activity, organised by their teacher, if they did not wish to take part, or their parents had opted them out of the study. Participants then engaged in the first part of a workshop on a topic of mental well-being. It was explained that
participants could withdraw from the study at any point and remove their data, without giving an explanation and with no consequence. Participants who wished to consent then received unique participants identifier numbers to ensure confidentiality. They then took part in an online survey which included consent, baseline measures and questions on demographic data. Additional measures were also included as part of a wider study, although these are not reported within this study. On a second chosen date the same process was continued, with the second part of the workshop and completion of the study survey. The M-Path Sense© (KU Leuven; https://m-path.io/landing/; Mestdagh & Verdonck et al., 2022) application was explained following the finalisation of the workshop and online survey. Participants were given paper brochures explaining the application and the procedure for participation for this part of the study. They were also offered the opportunity to download the app if they consented to this part of the study. Participants and Teachers were given a debrief information sheet and had the opportunity to answer any questions they had about the study.

**Measures**

*Attachment*

**Attachment: The Inventory of Parent and Peer Attachment- short form (IPPA-S; Raja et al., 1991; Armsden and Greenberg, 1987)**

This questionnaire is adapted from the original IPPA (Armsden & Greenberg, 1987), which measures attachment orientation towards parents and peers according to attachment theory. The authors posited that ‘internal working models’ of attachment figures can be assessed by items measuring affective and cognitive experience of trust in the accessibility and responsiveness of attachment figures and the affective and cognitive experiences of anger and/or hopelessness resulting from perceived unresponsive or inconsistently responsive attachment figures. Subsequently, the IPPA includes 53 brief questions (28 related to parents and 25 related to peers) with 5-point rating scales. Three broad constructs are assessed: degree of mutual trust (e.g., “I can count on my parents when I need to get something off my chest”), quality of communication (e.g., “I like to get my mother’s point of view on things I’m concerned about”), and degree of anger and alienation (e.g., “My mother expects too much from me”). Parental and Peer summary scores can be created by summing the Trust and Communication scores and then subtracting the Alienation scores (Pace et al., 2011). The IPPA was found to be the most valid and reliable self-report measure of attachment in adolescence in a systematic review (Jewell et al., 2019).
The dimensions are highly correlated within each relationship type and are therefore often aggregated to yield a single index of security/insecurity with respect to parents or peers (Crowell et al., 2008), however, it has been recommended that scores are separated for each relationship specified (Armsden & Greenberg, 1989). The IPPA has good internal consistency with Cronbach’s alpha coefficients between 0.72 and 0.91. Three-week test-retest estimates were between 0.86-0.93. Good convergent validity with associated theoretical outcomes have also been found with moderate correlations (Armsden & Greenberg, 1987). However, this measure was developed with a sample of participants aged 16-20 years and requires relatively extensive time from participants for completion. Therefore, the IPPA- short form (IPPA-S; Raja et al., 1991) was used in this study. The IPPA-S was developed from a sample of children and adolescents followed-up every two years from age three years to age 15 years. The three scales were shortened by including four items that loaded highest on total correlation coefficients of each scale, for parents and peers. The shortened version therefore includes 12 items for each parent and 12 items for the peers. The coefficient alpha was 0.82 for the parent scale and 0.80 for the peer scale.

**Attachment:** The Experiences in Close Relationships Scale – Revised – general short form (ECR-R-GSF; Wilkinson, 2011)

The ECR-R-GSF is adapted from the Experiences in Close Relationships Scale – Revised (ECR-R; Brenning et al., 2011), which was developed from the original measure, the Experiences in Close Relationships Scale (ECR; Fraley et al., 2000). The ECR-R-GSF was developed and revised for use with adolescents aged 11-22 years, and wording was altered to assess attachment relationships in general, rather than to specific caregivers or peers. Twenty items with five-point scales from 1 (*Strongly disagree*) to 5 (*Strongly agree*) are scored and split evenly between two dimensions, attachment avoidance and attachment anxiety. These dimensions are most strongly supported by taxometric analyses across attachment measures (Jewell et al., 2019; Fraley & Roisman, 2014) and mirror attachment style dimensions within the adult literature (Brennan et al., 1998; Mikulincer & Shaver, 2007). Anxiety and Avoidance items revealed two corresponding scales with good reliability, (Cronbach’s Alpha = .883 and .884, respectively) and correlated at .393. The measure did not converge with the parental relationship attachment as assessed by the IPPA, suggesting that the scales measure two separate constructs, namely attachment relationships in general vs attachment relationships to hierarchical attachment figures.

**Mental Health**

**Anxiety:** The Generalised Anxiety Disorder Assessment (GAD-7; Spitzer et al., 2006)
The GAD-7 assesses experiences of generalised anxiety disorder, according to symptom criteria in the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV). Participants are required to rate the severity of experienced symptoms over the previous two weeks, from 0 (‘not at all’), 1 (‘several days’), 2 (‘nearly every day’) to 3 (‘nearly every day’). The GAD-7 score ranges fall between 0-21. Scores of 5 suggest mild anxiety, scores of 10 suggest moderate and scores of 15 suggest severe anxiety. The internal consistency of the GAD-7 is excellent (Cronbach α = .92); test-retest reliability is good (intraclass correlation = 0.83).

Depression: Short Mood and Feeling Questionnaire (S-MFQ) (Angold et al., 1995)

The MFQ was developed to assess clinically meaningful symptoms of depressive disorders in children and adolescents aged six to 17 years, from clinical and non-clinical populations (Angold et al., 1995; Sharp et al., 2006). Items correspond to DSM Diagnostic criteria for Major Depressive Disorder (APA, 1994). The S-MFQ includes 12 items with possible responses of 0, (never); 1, (sometimes); 2, (always). A Cronbach’s alpha of 0.85 has been reported for the measure (Angold et al., 1995).

Emotion regulation

Emotion Regulation: The Cognitive Emotion Regulation Questionnaire (CERQ) (Garnefski & Jraajj, 2006)

The CERQ assesses self-reported cognitive components of emotion regulation, following stressful events. There are 9 subscales within the measure and responses are along a 5-point Likert scale, from Almost Never to Almost Always: Self-blame refers to thoughts of putting the blame for what you have experienced on yourself; Other-blame refers to thoughts of putting the blame for what you have experienced on the environment or another person; Rumination or focus on thought refers to thinking about the feelings and thoughts associated with the negative event. Catastrophizing refers to thoughts of emphasizing the terror of what you have experienced; Putting into perspective refers to thoughts of dismissing the seriousness of the event/emphasizing the relativity when comparing it to other events; Positive refocusing refers to thinking about pleasant events instead of thinking about the actual event; Positive reappraisal refers to thoughts of creating a positive meaning to the event in terms of personal growth; Acceptance refers to thoughts of accepting what you have experienced and Refocus on planning refers to thinking about what steps to take and how to solve the negative event. Higher scores are consistent with the more an emotion regulation strategy is used. Reported Cronbach’s α reliabilities of the subscales ranged from .75 to .86, with test-retest reliabilities of the subscales being adequate, with values ranging from .48 to .65 (Garnefski & Jraaj, 2006).
Experience Sampling Methodology Data

Data collected through the M-Path© (KU Leuven; https://m-path.io/landing/; Mestdagh & Verdonck et al., 2022) app pertained to time variant data for the variables of momentary negative and positive affect, social and environmental contextual factors, and attachment. A depository of items was created and adapted, with support from developers at a University in Belgium, KU Leuven, whereby ongoing research was being conducted. Various methods of self-report were utilised, including visual analogue scales, Likert scales, free text responses, and multiple-choice selection. Items were designed to require the shortest response time possible (under two minutes per app notification) and to be as least burdensome as possible, as suggested by current ESM literature (Myin-Germeys et al., 2018). Consequently, some variables of interest were measured according to few top-loading items of well validated scales, adapted to reflect the present moment. This approach is common and recommended within ESM research (Eisele et al., 2022; Gabriel et al., 2022). Prior to recruitment of participants, the developed ESM schedule was piloted on post-graduate students at the University of Edinburgh to assess feasibility and participant burden; response rates were high and good feasibility was reported. Feedback led to changes in wording of several items. The full depository of items was not completed by each participant for each notification. An algorithm was created, whereby items shown depended on previous responses given. Additionally, certain items, for example those relating to attachment behaviours and important events, were presented less frequently than others, such as affect items. Please view Table 1 in Appendix G for a summary of the repository.

Daily positive and negative affect. Items reflecting positive and negative affect were chosen according to the Circumplex Model of Affect (Russell, 1980; Posner et al., 2005; Yik et al., 2011), whereby various emotion labels were chosen to capture the spectrum of valence (pleasantness or unpleasantness) and level of arousal. Participants were therefore required to rate on visual analogue scales from 1 (Not much at all) to 10 (Very much) if they were currently experiencing any of the following emotions: happy, enthusiastic, relaxed, content, anxious, irritated, sad, insecure. Participants could rate one emotion and the intensity of this emotion per notification; a free text box also asked participants to note any other emotions they were experiencing and again rate from 1 (Not much at all) to 10 (Very much), the intensity of this emotion. A single score was created for both daily negative affect and daily positive affect by summing all ratings for negative and positive affect items, respectively. A single score for mean negative affect and mean positive affect across the week was each created, by summing the sum of daily affect items and dividing this by the number of days with responses.
**Location.** Participants could choose from multiple choices about their current location; these choices were coded as follows: 1 = at work (at school/university), 2 = at home, 3 = at a friends’ or families house, 4 = in public transport or in a car (passenger seat), 5 = somewhere else outside, 6 = somewhere else inside.

**Activities.** Participants were asked ‘What were you doing just before the beep?’, and could respond with the following coded choices: 1 = working/studying, 2 = resting/relaxing, 3 = everyday chores, 4 = errands/shopping, 5 = non-active leisure activity (reading, surfing internet, social media, gaming, watching television), 6 = active leisure activity (sports, walking, playing), 7 = I am on the move (walking, driving (passenger seat), public transportation), 8 = I am in a social interaction/conversation, 9 = Self-care/hygiene, 10 = Eating/Drinking. Participants were also required to rate on a 10-point scale (1 – not at all, to 10, very much) the following question and statements, ‘Do you like what you are doing?’, ‘It takes a lot of effort to do this activity’, ‘I would prefer to do something else right now’.

**Social contact.** Participants were required to respond to ‘Are you alone or with others?’, with coded responses of 1 = alone, 2 = with others physically, 3 = with others online. Items would then ‘branch’ with different presentation of items which depended upon previous responses given. Visual analogue rating scales from 1 (not at all) to 10 (very much), relating to appraisals of social contact, such as closeness/connection to those around them or preferences to be with others if alone.

**Momentary Attachment.** Three top loading items from the IPPA-Revised (Gullone & Robinson, 2005; Andretta et al., 2017) were adapted and used to capture attachment related cognitions and behaviours. Two items represented momentary attachment and were presented up to seven times per day and reflected ability to approach others for support ‘I feel comfortable to approach others for support right now’, and felt trust in others, ‘can trust others right now’; a corresponding seven-point Likert scale was provided for each item. Another item was presented once during the evening, on the final notification of the day, and reflected perceived emotional benefits when in contact with others. Participants were asked to respond to, ‘thinking back over the day...I felt better when I was around or in contact with others’, via a seven-point Likert scale from ‘1 (not at all)’ to ‘7 (very much)’.
Results

Demographic Information

61 participants in total consented to take part in the study, 36 of whom were recruited from two mainstream public schools and 25 who were recruited from NHS Lothian CAMHS services. Of the participants recruited from CAMHS, 20 were included in the study, after five participants dropped out. One of these participants completed only the ESM schedule without the baseline measures. Of the participants recruited from schools, six were included in the study; 29 participants completed an insufficient number of responses, as part the of ESM data collection or the online survey. Insufficient responses were classified as 0% in frequency of responses on the M-Path Sense© application and one or more missing responses in all questionnaires. One participant was removed due to apparent response bias, as all items were responded to with a single repeated rating response (i.e., ‘2’, ‘2’, ‘2’).

Demographic information was collected pertaining to participants’ age, gender, ethnicity and postcode. Information on postcode was collected to establish socioeconomic status. Table 2 presents the descriptive statistics for demographic data, as well as completion rates of measures across participants.
Table 2. Demographic data and number of participants who completed each of the study measures

<table>
<thead>
<tr>
<th>Measure</th>
<th>Data</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>Range = 14-18 years</td>
<td>M = 15.29 (SD = 1.38)</td>
</tr>
<tr>
<td>Gender</td>
<td>18 Female (69%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>8 Male (31%)</td>
<td></td>
</tr>
<tr>
<td>SES</td>
<td>Range = 2nd – 10th Decile</td>
<td>M = 7th Decile (SD = 3.01)</td>
</tr>
<tr>
<td>MFQ-S</td>
<td>M = 8.91 (SD = 5.23)</td>
<td>N = 22</td>
</tr>
<tr>
<td>GAD-7</td>
<td>M = 10.95 (SD = 4.23)</td>
<td>N = 22</td>
</tr>
<tr>
<td>ESM Measures</td>
<td>Response rate M = 70.29%</td>
<td>N = 22</td>
</tr>
<tr>
<td>ECR-R-GSF</td>
<td>M = 66.45 (SD = 12.31)</td>
<td>N = 22</td>
</tr>
<tr>
<td>CERQ</td>
<td>M = 47 (SD = 9.57)</td>
<td>N = 25</td>
</tr>
</tbody>
</table>

Note. SES = socioeconomic status; MFQ-S = Mood and Feelings Questionnaire (Angold et al., 1995); GAD-7 = The Generalised Anxiety Disorder Assessment (Spitzer et al., 2006); ESM = experience sampling methodology; ECR-R = Experiences in Close Relationships Scale – Revised, General Short Form (Wilkinson, 2011); CERQ = Cognitive Emotion Regulation Questionnaire (Garnefski & Jraajj, 2006). M = Mean; SD = Standard Deviation.

Statistical Analysis

Multiple regression analyses were firstly conducted on SPSS 27 statistical software, to examine the associations between attachment styles and emotion regulation and global levels of anxiety and depression. It was hypothesised that higher attachment anxiety and attachment avoidance would be associated with lower emotion regulation. Additionally, that higher attachment anxiety would be associated with higher levels of anxiety and depression, whilst attachment avoidance would be associated with higher levels of depression. Participants emotion regulation scores were regressed...
on attachment anxiety, attachment avoidance, and an interaction between both attachment styles. All variables were standardised via mean centering.

Multilevel models assume a hierarchical structure to data, whereby data at level one (responses during daily life) is nested within individuals, at level two. Multilevel modelling is a standard approach to the analysis of ESM data (Bolger & Laurenceau, 2013). Specifically, for the primary analysis, linear mixed models were utilised. The ‘lme4’ package was used within the statistical software R to conduct the linear mixed models (Bates et al., 2014; v 4.1.2, R Core Team, 2021). The outcome variables were daily negative affect and daily positive affect. Firstly, predictor variables of day, emotion regulation, attachment anxiety, attachment avoidance were added into each model. Secondly, the combined effect of momentary attachment and attachment styles were added as a latent variable, to understand the contribution of momentary attachment to daily negative and positive affect. Also, emotion regulation was added as a covariant to understand if the combined effect of attachment styles and momentary attachment was associated with daily positive and negative affect, mediated by emotion regulation. According to Baron and Kenny (1986), models of mediation can be investigated via multiple individual regression analyses. Mediation analyses require the steps of, i) regressing the mediator on the independent variable, ii) regressing the independent variable on the dependent variable, and iii) regressing the dependent variable on the independent variable and the mediator. More recent literature suggests that mediation may still be apparent without a significant relationship between the independent variable and the dependent variable, or step ii) (MacKinnon & Fairchild, 2009). Therefore, emotion regulation would be understood as a mediator if i) attachment significantly predicts emotion regulation, ii) attachment significantly predicts daily negative or positive affect, and iii) attachment and emotion regulation both predict daily negative and positive affect. According to the attachment theory of emotion regulation, it was hypothesised that lower attachment security would predict higher daily negative affect and lower daily positive affect. Further, emotion regulation would mediate the relationship between attachment and daily negative and positive affect. A p value of less than 0.05 was the determinant of statistical significance.

As various measures and analyses were utilised, the participants’ process of measure completion and corresponding statistical analyses is depicted in Figure 3. Whilst participants completed the The Inventory of Parent and Peer Attachment- short form (IPPA- S; Raja et al., 1991; Armsden and Greenberg, 1987) and various items within ESM, not all of these measures were included in the analyses.
Figure 3. Diagram depicting the measurement process, associated variables and corresponding analyses.

Note. SES = socioeconomic status; MFQ-S = Mood and Feelings Questionnaire (Angold et al., 1995); GAD-7 = The Generalised Anxiety Disorder Assessment (Spitzer et al., 2006); ESM = experience sampling methodology; ECR-R-GSF = Experiences in Close Relationships Scale – Revised, General Short Form (Wilkinson, 2011); CERQ = Cognitive Emotion Regulation Questionnaire (Garnefski & Kraaij, 2006). The variable ‘Day’ is the variance in Daily Positive Affect or Daily Negative Affect across measurement days.
Baseline Variables

Variables pertaining to baseline questionnaires were calculated for reliability using Cronbach’s alpha. Table 3 displays the results of this analysis.

Table 3. Reliability (Cronbach’s Alpha) of Each Included Subscale

<table>
<thead>
<tr>
<th>Questionnaire/Subscale</th>
<th>Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECR-R-GSF Total</td>
<td>.86</td>
</tr>
<tr>
<td>Attachment Avoidance</td>
<td>.86</td>
</tr>
<tr>
<td>Attachment Anxiety</td>
<td>.83</td>
</tr>
<tr>
<td>GAD-7</td>
<td>.79</td>
</tr>
<tr>
<td>MFQ</td>
<td>.91</td>
</tr>
<tr>
<td>CERQ Total</td>
<td>.78</td>
</tr>
<tr>
<td>CERQ Maladaptive</td>
<td>.66</td>
</tr>
<tr>
<td>CERQ Adaptive</td>
<td>.81</td>
</tr>
<tr>
<td>CERQ Self-Blame</td>
<td>.67</td>
</tr>
<tr>
<td>CERQ Acceptance</td>
<td>.77</td>
</tr>
<tr>
<td>CERQ Rumination</td>
<td>.53</td>
</tr>
<tr>
<td>CERQ Positive Refocus</td>
<td>.76</td>
</tr>
<tr>
<td>CERQ Refocus on Planning</td>
<td>.24</td>
</tr>
<tr>
<td>CERQ Positive Reappraisal</td>
<td>.20</td>
</tr>
<tr>
<td>CERQ Perspective</td>
<td>.77</td>
</tr>
<tr>
<td>CERQ Catastrophizing</td>
<td>.73</td>
</tr>
<tr>
<td>CERQ Other Blame</td>
<td>.42</td>
</tr>
</tbody>
</table>

Note. ECR-R-GSF = Experiences in Close Relationships – Revised – General Short Form (Wilkinson, 2011); MFQ-S = Mood and Feelings Questionnaire (Angold et al., 1995); GAD-7 = The Generalised Anxiety Disorder Assessment (Spitzer et al., 2006); CERQ = Cognitive Emotion Regulation Questionnaire (Garnefski & Jraajj, 2006)

The CERQ subscales Refocus on Planning and Positive Reappraisal were removed from the analysis due to an unacceptable Cronbach’s Alpha level.

Primary Analysis

The results of the multiple regression analysis for scores of emotion regulation can be viewed in Table 4. The standardised residual for emotion regulation as the dependent variable was -1.349 to 2.052. Multicollinearity was also not a concern (attachment avoidance Tolerance = .842, VIF = 1.213; attachment anxiety Tolerance = .783, VIF = 1.276; attachment anxiety and attachment avoidance interaction Tolerance = .801, VIF = 1.248). The data also met the assumption of independent errors (Durbin-Watson value = 1.595). Emotion regulation was not significantly associated with any of the predictor variables, including attachment anxiety (F = .768, R² = .114, adjusted R² = -0.34, β = -.266, p = .238, CI = [-303, 1.145]) and attachment avoidance (β = .421, p = .394, CI = [-906, .374]).
attachment styles also did not interact in predicting emotion regulation strategies ($\beta = -0.021, p = 0.573, CI = [-0.099, 0.057]$).

Table 4. Multiple Regression Model for Emotion Regulation

<table>
<thead>
<tr>
<th></th>
<th>$\beta$</th>
<th>SE</th>
<th>$t$</th>
<th>$p$</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>1.408</td>
<td>2.224</td>
<td>0.633</td>
<td>0.535</td>
<td>[-3.265, 6.081]</td>
</tr>
<tr>
<td>Attachment anxiety</td>
<td>-0.266</td>
<td>0.345</td>
<td>1.221</td>
<td>0.238</td>
<td>[-3.03, 1.145]</td>
</tr>
<tr>
<td>Attachment avoidance</td>
<td>0.421</td>
<td>0.305</td>
<td>-0.872</td>
<td>0.394</td>
<td>[-0.906, 0.374]</td>
</tr>
<tr>
<td>Attachment anxiety $\times$ attachment avoidance</td>
<td>-0.021</td>
<td>0.037</td>
<td>-0.573</td>
<td>0.573</td>
<td>[-0.099, 0.057]</td>
</tr>
</tbody>
</table>

Note. CI = Confidence Interval

Regarding global anxiety (Table 5), the standardised residual was -1.624 to 1.474. Multicollinearity was not a concern (attachment avoidance Tolerance = .776, VIF = 1.289; attachment anxiety Tolerance = .555, VIF = 1.803, attachment avoidance and attachment anxiety interaction Tolerance = .658, VIF = 1.519). The data met the assumption of independent errors (Durbin-Watson value = 1.622). The multiple regression showed that none of the predictor variables predicted global anxiety, including attachment avoidance ($F = 1.809, R^2 = .266$, adjusted $R^2 = .119, \beta = -0.017, p = 0.909, CI = [-0.300, 0.334]$). Attachment anxiety was also not associated with global anxiety levels, although approached significance ($\beta = 0.421, p = 0.082, CI = [-0.050, 0.731]$). The interaction between attachment anxiety and attachment avoidance was also not associated with global anxiety scores ($\beta = -0.026, p = 0.307, CI = [-0.027, 0.080]$).

For global depressions scores (Table 6), the standardised residual was -1.534 to 2.558. Multicollinearity was not a concern (attachment avoidance Tolerance = .776, VIF = 1.289, attachment anxiety Tolerance = .555, VIF = 1.803, attachment avoidance and attachment anxiety interaction Tolerance = .658, VIF = 1.519). The data was slightly below the required value to meet the assumption of independent errors (Durbin-Watson = .924). As such, the histogram of standardised residuals and the normal P-P plot of standardised residuals were examined. These indicated that the data had normally distributed errors. The scatter plot was also viewed which indicated that the data met the assumption of Homoscedasticity and Linearity. There was no association with attachment avoidance ($F = 0.777, R^2 = 0.134$, adjusted $R^2 = -0.039, \beta = -0.001, p = 0.995, CI = [-0.382, 0.384]$). There was also no association with attachment anxiety ($\beta = -0.216, p = 0.343, CI = [-
.255, .687]). The interaction between attachment anxiety and attachment avoidance was not associated with global depression scores (β = .011, p = .721, CI = [-.054, .076]).

Table 5. Multiple Regression Model for Global Anxiety

<table>
<thead>
<tr>
<th></th>
<th>β</th>
<th>SE</th>
<th>t</th>
<th>p</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>-.336</td>
<td>1.056</td>
<td>-.318</td>
<td>.755</td>
<td>[-2.600, 1.928]</td>
</tr>
<tr>
<td>Attachment anxiety</td>
<td>.421</td>
<td>.182</td>
<td>1.872</td>
<td>.082</td>
<td>[.050, .731]</td>
</tr>
<tr>
<td>Attachment avoidance</td>
<td>.017</td>
<td>148</td>
<td>.117</td>
<td>.909</td>
<td>[-.300, .334]</td>
</tr>
<tr>
<td>Attachment anxiety ×attachment avoidance</td>
<td>.026</td>
<td>.025</td>
<td>1.061</td>
<td>.307</td>
<td>[-.027, .080]</td>
</tr>
</tbody>
</table>

Note. CI = Confidence Interval

Table 6. Multiple Regression Model for Global Depression

<table>
<thead>
<tr>
<th></th>
<th>β</th>
<th>SE</th>
<th>t</th>
<th>p</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>.607</td>
<td>1.275</td>
<td>.476</td>
<td>.641</td>
<td>[-2.127, 3.341]</td>
</tr>
<tr>
<td>Attachment anxiety</td>
<td>.216</td>
<td>.220</td>
<td>.982</td>
<td>.343</td>
<td>[-.255, .687]</td>
</tr>
<tr>
<td>Attachment avoidance</td>
<td>.001</td>
<td>.178</td>
<td>.007</td>
<td>.995</td>
<td>[-.382, .384]</td>
</tr>
<tr>
<td>Attachment anxiety ×attachment avoidance</td>
<td>.011</td>
<td>.030</td>
<td>.365</td>
<td>.721</td>
<td>[-.054, .076]</td>
</tr>
</tbody>
</table>

Note. CI = Confidence Interval

**Negative Affect.** Within the multilevel model with daily negative affect as the outcome, none of the predictor variables had a significant effect on daily negative affect, including day (β = 0.091, p = 0.727), attachment anxiety (β = -0.016, p = 0.696) or attachment avoidance (β = -0.031, p = 0.924). The effect of emotion regulation approached significance (β = 1.154, p = 0.054), although the interaction between emotion regulation and day showed no significant effect (β = 0.031p = 0.715). These findings suggest that the attachment dimensions, as measured at baseline, did not predict daily negative affect. Further, daily negative affect did not vary across days. Emotion regulation did not predict daily negative affect overall or across days.
Table 7. Multilevel Model for Daily Negative Affect.

<table>
<thead>
<tr>
<th></th>
<th>β</th>
<th>SE</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>4.332</td>
<td>1.629</td>
<td>2.66</td>
<td>&lt;0.00</td>
</tr>
<tr>
<td>Day</td>
<td>0.091</td>
<td>0.262</td>
<td>0.349</td>
<td>0.727</td>
</tr>
<tr>
<td>Emotion Regulation</td>
<td>1.154</td>
<td>0.540</td>
<td>2.136</td>
<td>0.054</td>
</tr>
<tr>
<td>Attachment Anxiety</td>
<td>-0.016</td>
<td>0.041</td>
<td>-0.400</td>
<td>0.696</td>
</tr>
<tr>
<td>Attachment Avoidance</td>
<td>-0.031</td>
<td>0.034</td>
<td>-0.096</td>
<td>0.924</td>
</tr>
<tr>
<td>Day x Emotion Regulation</td>
<td>0.031</td>
<td>0.084</td>
<td>0.366</td>
<td>0.715</td>
</tr>
</tbody>
</table>

**Positive Affect.** The multilevel model for positive affect revealed no predictor variables to have significant effects, including day ($\beta = -0.294$, $p = 0.369$), emotion regulation ($\beta = 0.417$, $p = 0.503$), attachment anxiety ($\beta = -0.006$, $p = 0.889$), or attachment avoidance ($\beta = -0.024$, $p = 0.555$). The interaction between day and emotion regulation had no significant effect ($\beta = 0.142$, $p = 0.216$). The findings suggest that the attachment dimensions, as measured at baseline, did not predict daily positive affect. This was also the case for emotion regulation. Additionally, daily positive affect did not vary across days, and the interaction between emotion regulation and days did predict daily positive affect.

Table 8. Multilevel Model for Daily Positive Affect

<table>
<thead>
<tr>
<th></th>
<th>β</th>
<th>SE</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>6.288</td>
<td>1.951</td>
<td>3.223</td>
<td>0.001</td>
</tr>
<tr>
<td>Day</td>
<td>-0.294</td>
<td>0.327</td>
<td>-0.900</td>
<td>0.369</td>
</tr>
<tr>
<td>Emotion Regulation</td>
<td>0.417</td>
<td>0.619</td>
<td>0.672</td>
<td>0.503</td>
</tr>
<tr>
<td>Attachment Anxiety</td>
<td>-0.006</td>
<td>0.046</td>
<td>-0.141</td>
<td>0.889</td>
</tr>
<tr>
<td>Attachment Avoidance</td>
<td>-0.024</td>
<td>0.039</td>
<td>-6.606</td>
<td>0.555</td>
</tr>
<tr>
<td>Day x Emotion Regulation</td>
<td>0.142</td>
<td>0.115</td>
<td>1.241</td>
<td>0.216</td>
</tr>
</tbody>
</table>

**Contribution of momentary attachment and emotion regulation as a mediator for daily negative affect.** The latent variable of attachment was estimated using the Tucker-Lewis Index (TLI) and the comparative fit index (CFI). The TLI (0.935) and CFI (0.976) revealed close to perfect and acceptable model fits, respectively, for the variables of attachment avoidance (estimate = 1.000), with added attachment anxiety (estimate = 1.081, $p < 0.001$) and momentary attachment (estimate = -0.653, $p < 0.001$). As higher scores on momentary attachment reflected higher attachment security, this was reversed. Therefore, higher scores on the latent variable of attachment reflected lower attachment security.
Attachment was associated with daily negative affect (estimate = 0.544, \( p = 0.001 \)), in that higher attachment insecurity was associated with increased daily negative affect. Additionally, emotion regulation was significantly associated with increased daily negative affect (estimate = 11.435, \( p < 0.001 \)). The covariance between emotion regulation and attachment also reached significance (estimate = 1.670, \( p < 0.001 \)). These results suggest that emotion regulation mediated the prediction of attachment on daily negative affect. On average, daily negative affect increased by a rating of 0.54 by each unit decrease in attachment security. On average, daily negative affect increased by 11.44 points for every unit increase in emotion regulation.

### Table 9. Multilevel Model with Attachment and Emotion Regulation as a Mediator for Daily Negative Affect

<table>
<thead>
<tr>
<th></th>
<th>( \beta )</th>
<th>( SE )</th>
<th>( p )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attachment</td>
<td>0.544</td>
<td>0.169</td>
<td>0.001</td>
</tr>
<tr>
<td>Emotion Regulation</td>
<td>11.435</td>
<td>1.388</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Covariance Emotion Regulation and Attachment</td>
<td>1.670</td>
<td>0.316</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

**Contribution of momentary attachment and emotion regulation as a mediator for daily positive affect.** The latent variable of attachment revealed a close to perfect (CLI = 0.960) and acceptable (TLI = 0.914) model fit for the variables of attachment avoidance (estimate = 1.000), with added attachment anxiety (estimate = 0.795, \( p < 0.001 \)) and momentary attachment (estimate = -0.580, \( p < 0.001 \)). As higher scores on momentary attachment reflected higher attachment security, this was reversed. Therefore, higher scores on the latent variable of attachment reflected lower attachment security.

Attachment was not associated with daily positive affect (estimate = -0.043, \( p = 0.073 \)), although was in a negative direction. However, emotion regulation had a positive association with daily positive affect (estimate = 0.553, \( p < 0.001 \)). The covariance between emotion regulation and attachment also reached significance (estimate = 3.336, \( p < 0.001 \)). This suggests that emotion regulation has a positive association with daily positive affect and alters the direction of the relationship between attachment on daily positive affect. On average, daily positive affect increased by a rating of 0.55 for every unit increase in emotion regulation. This effect increased by 3.34 when considering the covariance between attachment and emotion regulation.
Table 10. Multilevel Model with Attachment and Emotion Regulation as a Mediator for Daily Positive Affect

<table>
<thead>
<tr>
<th></th>
<th>β</th>
<th>SE</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attachment</td>
<td>-0.043</td>
<td>0.024</td>
<td>0.073</td>
</tr>
<tr>
<td>Emotion Regulation</td>
<td>0.553</td>
<td>0.153</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Covariance Emotion Regulation and Attachment</td>
<td>3.336</td>
<td>0.651</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

Discussion

This study aimed to investigate the experience and regulation of emotion for adolescents in relation to attachment styles. Firstly, self-reports of attachment anxiety and attachment avoidance were collected, as well as emotion regulation and global levels of anxiety and depression. Secondly, momentary measurement of attachment and negative and positive affect were collected during daily life. Contrary to the hypotheses and attachment theory, measures of attachment styles were not associated with emotion regulation nor global anxiety or depression. Additionally, attachment styles were also not related to daily negative or positive affect. This was also the case for emotion regulation. However, when a latent variable, combining attachment styles and momentary attachment was examined, lower attachment security was associated increased daily negative affect. Additionally, lower attachment security was associated with emotion regulation, which was also associated with increased daily negative affect. This suggests that emotion regulation is positively associated with increased negative affect when attachment security is lower and mediated this relationship. Interestingly, when momentary attachment was included into the latent variable with attachment styles, there was no association with positive affect, although this was non-significantly in a negative direction. However, attachment was positively associated with emotion regulation, whilst emotion regulation was positively associated with daily positive affect. This suggests that emotion regulation may attenuate the relationship between attachment and daily positive affect. These findings suggest that the measurement of momentary attachment contributes to the understanding of the effects of overall attachment on emotion regulation and momentary experience of affect. Additionally, the finding that emotion regulation was positively associated with both daily negative and positive affect, suggests that different emotion regulation strategies are endorsed by individuals, which led to increased daily positive or negative affect, dependent on attachment.
Study limitations

There are several limitations within the present study. This study included a relatively small sample size, including adolescents mainly from a clinical population, which may have impacted findings. Recruitment of participants within mainstream schools was restricted by the covid-19 pandemic safety measures and political issues such as school staff strikes, paired with low response rates to measures within this population. Additionally, few schools contacted the researchers to show interest within the study; other school staff who did contact the research team but did not take part, were not able to offer the time required out of the curriculum and with sufficient staff members to support the running of the workshops. Participation rates may have been affected by school staffing issues, as one two occasions, non-permanent staff members or substitute Teachers were involved in the workshops, meaning encouragement or support with the study was limited after the workshops were completed. Such issues should be considered in future studies utilising ESM within school populations. As such, few participants from a non-clinical population were included. This resulted in lower statistical power within the analyses. Additionally, due to the inclusion of participants mainly from specialist mental health services, ceiling effects were more likely on measures of attachment styles, as higher attachment insecurity is more likely to occur within adolescents from clinical populations (Kobak et al., 2015). This is evidenced as a recent study on the psychometric properties of the ECR-R-GSF (Imran et al., 2020) revealed that the mean score on this measure was 29.62 (SD = 13) within a population of healthy adolescents, whereas within this study the mean score was 66.45 (SD = 12.31). This may have led to reduced variance in the data, and affected examined relationships between attachment styles, emotion regulation and dependent variables. Furthermore, according to attachment theory, the attachment system activates according to threat or stress (Bowlby, 1982; Ainsworth, 1979; Fraley, 2019). Within this study, ESM items were included to capture moments participants had experienced an important event, which was either rated as pleasant or unpleasant and stressful, and participants were also required to rate which momentary emotion regulation strategies they used to deal with this. The collection of this data was therefore context dependent and infrequent. Due to the lower number of participants, it was therefore not possible to collect data on momentary levels of stress or emotion regulation. Having said this, this study is the first to employ a measurement of momentary attachment within an adolescent population, and so provides insight into the contribution that momentary attachment can have when investigating attachment theory.

Other limitations within this study include the measurement of emotion regulation and attachment. The use of the CERQ within this study (Garnefski & Jraajj, 2006) was limited to the total scores and overall use of emotion regulation strategies. This measure allows for the partition of various
emotion regulation strategies, which have also been divided into adaptive and maladaptive categories in previous studies (Huh et al., 2017). Although this method was not developed with the original use of the measure, including adaptive and maladaptive strategies would have given a more precise investigation of the relationship between attachment, emotion regulation and daily affect. Subsequently, this use of the measure would help to investigate why emotion regulation was associated with both increased daily positive and negative affect, and why the covariance between attachment and emotion regulation was a stronger predictor for daily positive affect than emotion regulation alone. It may be that the association between emotion regulation and affect depends on the specific emotion regulation strategies used, and the use of specific emotion regulation depends upon the attachment style of the individual. For example, whilst not statistically significant, lower attachment security and daily positive affect was in a negative direction, whilst emotion regulation was associated with positive affect in a positive direction. Emotion regulation may therefore prevent attachment from leading to reduced positive affect when adaptive strategies are used. However, as lower attachment security was associated with increased daily negative affect, as was emotion regulation, it is likely that the specific strategies used are maladaptive within this relationship. Inclusion of other context dependent aspects of the attachment behavioural system would elucidate findings further. For example, Sheinbaum et al. (2015) revealed that attachment styles affect daily affect differentially in adults, according to the perceived closeness of others. Whilst the current study included items measuring adolescents’ momentary social contexts, and baseline attachment to mothers, fathers and peers, this data was not included within the current analysis. Inclusion of these variables in future analyses will help to elucidate the complex nature of attachments on well-being outcomes. For example, Keizer et al. (2019) showed that overall changes to adolescents’ attachment to mothers, but not fathers, were positively linked to changes in self-esteem; changes to attachment with fathers was only positively associated with changes in self-esteem for daughters, not sons. The unique contribution of attachments within specific relationships and momentary social situations will advance this research further.

**Comparison with previous literature**

Insecure attachment has been evidenced as an important factor in the development of psychopathology, such as depression and anxiety, with an onset usually during adolescence (Malik et al, 2015; Esborn et al., 2012; Cooke et al., 2018). Studies also highlight the mediating role of emotion regulation, supporting the attachment theory of emotion regulation, whereby high levels of attachment anxiety lead to hyperactivating strategies, and attachment avoidance leads to deactivating strategies (Esborn et al., 2012; Cooke et al., 2018; Mikulincer & Shaver, 2019). These studies, however, have overwhelmingly utilised cross-sectional measures of the constructs or
included only two of three per study, thereby being unable to directly assess the mediating role of emotion regulation as hypothesised (Esborn et al., 2012).

More recently, ESM has been employed to account for the context dependent nature of attachment and related constructs of emotional experience and regulation, thereby allowing true investigation of attachment theory (Fraley, 2019). However, to the author’s knowledge, this is the first study to consider all three variables when using this methodology. Three studies have measured momentary attachment within real-life contexts using ESM, to measure the effect on daily negative and positive affect (Sitko et al., 2016; Ludwig et al., 2020; Dancik et al., 2023). These studies included adult samples who were experiencing psychosis and focused on the contribution of momentary attachment to the experiences of related symptoms, such as paranoia. Sitko et al. (2016) employed a strong design, in that the temporal associations between stress, led to increased attachment insecurity, which led to an increase in the experience paranoia. Temporal associations found here provide confidence in the models of nuanced pathways of such variables.

Dancik et al. (2023) took these steps further and considered the unique contribution of momentary attachment anxiety and attachment avoidance. They found that increases in both insecure attachment dimensions led to increases in negative affect, replicating the findings within the current study. Only state attachment avoidance led to a decrease in positive affect, and a subsequent increase in paranoid thinking. Importantly, the current study did not separate the attachment anxiety and attachment avoidance dimensions, although it was found that the covariance between attachment and emotion regulation predicted increased positive affect. Within the current study, it may have been that adolescents high in attachment anxiety used regulation strategies which increased positive affect. Whilst Dancik et al. (2023) argue that the experience of increased daily negative affect is indicative of maladaptive emotion regulation, supported by the claim that both constructs occur simultaneously (Campos et al., 2004; Gross, 2014), Ludwig et al. (2020) were the only study to measure emotion regulation explicitly. In this study emotion regulation was measured cross-sectionally and via ESM items. Interestingly, the cross-sectional measure of emotion regulation revealed more habitual use of maladaptive emotion regulation strategies in adults experiencing psychosis, compared to a control group, but this did not predict emotion regulation within daily life. In fact, adults experiencing psychosis used more maladaptive and adaptive strategies than the control group. Surprisingly, some strategies were adaptive in reducing negative affect in the clinical group, such as expressive suppression, but maladaptive in the control group. It is suggested that such findings indicate that clinical groups may use emotion regulation strategies differentially or less contextually appropriate, rather than according to a linear relationship whereby use of adaptive strategies results in lower negative affect and higher positive affect (Visser et al., 2018). Future
studies would therefore benefit from measuring emotion regulation strategies via ESM in a context dependent manner.

A second explanation may be that clinical groups simply experience higher levels of negative affect and lower levels of positive affect, which require increased use of emotion regulation strategies. Within the current study higher attachment insecurity shared covariance with emotion regulation in predicting increased positive affect, suggesting that participants were successful in emotion regulation attempts. Additionally, since emotion regulation also predicted increased negative affect, it is clear that participants used a range of adaptive and maladaptive strategies. As adolescents within this sample were attending specialist mental health services, their treatment may have contributed the findings, since adaptive emotion regulation abilities are likely a part of treatment. However, without comparison to a non-clinical control group, it is unclear how successful emotion regulation was, since the norm levels of increase in positive affect cannot be compared. Additionally, participants within this study cannot be compared to adults experiencing psychosis, as levels of emotion regulation abilities may vary in a continuous manner between severity of mental health presentations (Igra et al., 2023).

It is important to note that all studies which have measured constructs such as emotion regulation, attachment, and daily affect experience reported here, have included measures which have not been validated according to common approaches such as factor analysis. Whilst close to perfect model fits were found within this study, combining momentary attachment with attachment dimensions measured by the ECR-R-GSF (Wilkinson, 2011), into a latent variable, limitations of measuring constructs according to few items must be considered. Future research will benefit from validating ESM items by analysing associations with trait measures.

**Conclusion**

This study reports on several findings relevant to the attachment theory of emotion regulation during the key developmental stage of adolescence. Attachment anxiety and attachment avoidance, as measured cross-sectionally, were not associated with trait measures of emotion regulation nor anxiety and depression. Contrastingly, when momentary attachment was included within a latent variable with the attachment dimensions, lower attachment security was associated with increased emotion regulation, which predicted increased daily negative affect. Lower attachment security was not associated with positive affect, although was associated with emotion regulation and shared variance in predicting increased positive affect. It is concluded that momentary attachment can predict emotion regulation abilities and the moment-to-moment experience of affect. Adolescents experiencing mental health difficulties appear to employ a range of emotion regulation abilities,
which can be effective, but are also ineffective in that they lead to higher levels of momentary negative affect. Over time, such patterns may contribute to the experience of mental health problems. Clinical interventions which focus on momentary attachment and contextual emotion regulation abilities may be a key treatment target within this age group. Future studies would benefit from considering situational factors which may activate the attachment system and lead to difference in contextual measures of emotion regulation.
References


Ireland, Clough and Day (2017). The cognitive emotion regulation questionnaire: Factorial, convergent and criterion validity analyses of the full and short versions


103


Appendix A

NHS Research Ethics Committee Ethics Approval

East of Scotland Research Ethics Service (EoSRES)

Mr Jordan Bibby
Paediatric Psychology and Liaison Service
PHCYP
2nd Floor, Area 4
Edinburgh Bioquarter
Edinburgh, EH16 4TJ

Dear Mr Bibby

Study title: Investigating psychological predictors of distress and mechanisms of change in mental health treatment in adolescents

REC reference: 21/ES/0043
Protocol number: CAHSS2012:07
Amendment number: Substantial Amendment 2 (AM05 For Reference Only)
Amendment date: 03 October 2022
IRAS project ID: 291852

The above amendment was reviewed on 16 November 2022 by the Sub-Committee in correspondence.

Ethical opinion

The members of the Committee taking part in the review gave a favourable ethical opinion of the amendment on the basis described in the notice of amendment form and supporting documentation.

Approved documents

The documents reviewed and approved at the meeting were:

<table>
<thead>
<tr>
<th>Document</th>
<th>Version</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Completed Amendment Tool</td>
<td>SA (AM05)</td>
<td>03 October 2022</td>
</tr>
<tr>
<td>[{Updated}291852_Substantial Amendment]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other [Covering email with amended documents]</td>
<td></td>
<td>01 November 2022</td>
</tr>
<tr>
<td>Other [Response to Sub-Committee]</td>
<td></td>
<td>22 November 2022</td>
</tr>
<tr>
<td>Other [Further clarification for Sub-Committee]</td>
<td></td>
<td>29 November 2022</td>
</tr>
<tr>
<td>Participant information sheet (PIS) [12 - 15 years (Clean)]</td>
<td>6</td>
<td>22 November 2022</td>
</tr>
</tbody>
</table>
Membership of the Committee

The members of the Committee who took part in the review are listed on the attached sheet.

Working with NHS Care Organisations

Sponsors should ensure that they notify the R&D office for the relevant NHS care organisation of this amendment in line with the terms detailed in the categorisation email issued by the lead nation for the study.

Amendments related to COVID-19

We will update your research summary for the above study on the research summaries section of our website. During this public health emergency, it is vital that everyone can promptly identify all relevant research related to COVID-19 that is taking place globally. If you have not already done so, please register your study on a public registry as soon as possible and provide the HRA with the registration detail, which will be posted alongside other information relating to your project.

Statement of compliance

The Committee is constituted in accordance with the Governance Arrangements for Research Ethics Committees and complies fully with the Standard Operating Procedures for Research Ethics Committees in the UK.
HRA Learning

We are pleased to welcome researchers and research staff to our HRA Learning Events and online learning opportunities—see details at:
https://www.hra.nhs.uk/planning-and-improving-research/learning/

IRAS Project ID - 291852: Please quote this number on all correspondence

Yours sincerely

for Dr Sharon King
Chair

Email: tay.eosres@nhs.scot

Enclosures: List of names and professions of members who took part in the review

Copy to: Miss Charlotte Smith
Professor Matthias Schwannauer
Appendix B

R & D Approval

University Hospitals Division

Queen’s Medical Research Institute
47 Little France Crescent, Edinburgh, EH16 4TJ

22nd October 2021

Ms Emma Martin
Trainee Clinical Psychologist
Psychology Department
Mackinnon House (2nd Floor)
Morningside Terrace
Edinburgh
EH10 5HF

Research & Development
Room E1.10
Tel: 0131 242 3330
Email: accord@nhlothian.scot.nhs.uk

Director: Professor Alasdair Gray

Dear Ms Martin

CALDICOTT APPLICATION: CRD21063

An IG/IT security risk assessment has been undertaken on your study. Sign-off under the delegated Caldicott authority within R&D has been granted on the basis that various conditions are met.

<table>
<thead>
<tr>
<th>Title of project / proposal</th>
<th>Investigating psychological predictors of distress and mechanisms of change in mental health treatment in adolescents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reference:</td>
<td>R&amp;D No: 2021/0064  IRAS No: 291852  REC No: 21/ES/0043</td>
</tr>
<tr>
<td>Systems capturing or storing Patient identifiable or personal information</td>
<td>KU LEUVEN R&amp;D (App used for data collection)</td>
</tr>
</tbody>
</table>

Approved: 22nd October 2021

Conditions of Approval:
- Participants need to be aware that their data will be stored by an external company (KU LEUVEN R&D) based in Belgium. Amendment to the study Participant Information Sheet and Consent Form is required.
Please provide confirmation of acceptance of the requirements set out above.

Yours sincerely

Pavlina Yaneva McGovern
R&D Information Governance Lead

Research and Development, NHS Lothian

On behalf of: Miss Tracey Gillies, Executive Medical Director and Caldicott Guardian for NHS Lothian

Cc:
Professor Matthias Schwannauer
Dear Ms Martin

Lothian R&D Project No: 2021/0064
Title of Research: Investigating psychological predictors of distress and mechanisms of change in mental health treatment in adolescents


Consent Form (16-18): Version 3.0, dated 28 June 2021
Consent Form (12-15): Version 2.0, dated 9 June 2021

Protocol: Version 2.0, dated 9 June 2021
Approved Location(s) within NHS Lothian: Outpatient CAMHS teams

REC No: 21/ES/0043

I am pleased to inform you this letter provides Site Specific approval for NHS Lothian for the above study and you may proceed with your research, subject to the conditions below.

We note that this study has obtained approval from NHS Lothian Information Governance/IT Security for those aspects of the study that involve collection and/or transfer of identifiable information. You are responsible for informing the NHS Lothian R&D Office if there are any changes to the study that
Please be aware that ACCORD has issued COVID-19 Clinical Research Plan and Guidance that includes instructions for restarting/commencing non-COVID-19 clinical research, and also advice on what to do if there is a requirement to halt recruitment of new participants to an active study, what to do if the study design needs to be amended or if there is a resource issue within the study team in light of the ongoing COVID-19 pandemic.

The ACCORD guidance is available on the ACCORD website; http://www.accord.scot/about-accord/accord-news/covid19-planning-and-guidance-research-0

The guidance detailed here applies to research projects Sponsored by NHS Lothian and/or the University of Edinburgh and to NHS Lothian hosted studies until further notice.

Please note that the NHS Lothian R&D Office must be informed of any changes to the study such as amendments to the protocol, funding, recruitment, personnel or resource input required of NHS Lothian.

Substantial amendments to the protocol will require approval from the ethics committee which approved your study and the MHRA where applicable.

Data controllers and processors have a legal obligation to hold a register of all its information assets (e.g. personal information (data) and/or special categories of personal data held in paper or electronic format for the purpose of clinical research). This R&D management approval is given on the understanding that you, as a potential information asset owner, will register any information assets associated with this research project with your employing organisation (where the data is held) in accordance the Data Protection Act 2018.

Please keep this office informed of the following study information, which is a condition of NHS Lothian R&D Management Approval:

1. Date you are ready to begin recruitment, date of the recruitment of the first participant and the monthly recruitment figures thereafter.
1. Ensure recruitment targets are met.
2. Date the final participant is recruited and the final recruitment figures.
3. Date your study / trial is completed within NHS Lothian.

I wish you every success with your study.

Yours sincerely

Fiona McArdle
Deputy R&D Director

cc Professor Matthias Schwannauer, Chief Investigator, UoE
    Tracey McKigen, Services Director, Psychiatry, RIE
Dear Professor Schwannauer

REC No: 21/ES/0043
R&D Project ID No: 2021/0064
Title of Research: Investigating psychological predictors of distress and mechanisms of change in mental health treatment in adolescents

I am writing in reply to recent correspondence in relation to an amendment(s) to the above project and the subsequent updated documents as follows.

Amendment: Substantial amendment No.2 dated 3 October 2022
  o Participant Information Sheet (12-15 Years) Version 6, dated 22 November 2022
  o Participant Information Sheet (16-18 Years) Version 6, dated 22 November 2022
  o Participant Information Sheet (Parent) Version 6, dated 22 November 2022
  o Protocol Version 6, dated 22 November 2022
  o Addition of Simone Di Polo and Koralma Sotomayor Enríquez to the research team
  o Change of PI from Ms Emma Martin to Mr Jordan Bibby Superseded

Amendment: Minor amendment No.3 dated 3 May 2023
  o Change of PI from Mr Jordan Bibby to Professor Matthias Schwannauer

We have now assessed any consequential changes and can confirm that NHS Lothian management approval is extended to cover the specific changes intimated.
Yours sincerely

Kenneth Scott
NRS Generic Review Manager

cc: Mr Jordan Bibby, Trainee Clinical Psychologist, NHS Lothian

---

Approval - LOT (SA02 & NSA03), 12.06.23
Final Audit Report

Created: 2023-06-12
By: Lesley Saeed (v1more@exseed.ed.ac.uk)
Status: Signed
Transaction ID: CIUCHBAAAABAAQG6ZstlWEk0pLwv-wVP79dR3qJjJgY3o

"Approval - LOT (SA02 & NSA03), 12.06.23" History

Document created by Lesley Saeed (v1more@exseed.ed.ac.uk)
2023-06-12 - 10:23:53 GMT - IP address: 02.253.82.232

Document emailed to kenneth.scott@nhslothian.scot.nhs.uk for signature
2023-06-12 - 10:28:22 GMT

Email viewed by kenneth.scott@nhslothian.scot.nhs.uk
2023-06-12 - 10:31:18 GMT - IP address: 104.47.0.284

Signer kenneth.scott@nhslothian.scot.nhs.uk entered name at signing as Kenneth Scott
2023-06-12 - 10:32:36 GMT - IP address: 02.253.82.231

Document e-signed by Kenneth Scott (kenneth.scott@nhslothian.scot.nhs.uk)
Appendix C

Edinburgh City Council Ethics Approval

---

Jordan Bibby
Trainee Clinical Psychologist
School of Health in Social Science
The University of Edinburgh
Old Medical School
Teviot Place
Edinburgh
EH8 9AG

Date 15/03/22

Dear Jordan,

I am writing in response to your application requesting permission to undertake research in schools in The City of Edinburgh.

Your request has been considered, and I am pleased to inform you that you have been given permission in principle to undertake your research. I must stress that it is the policy of this Authority to leave the final decision about participation in research projects of this kind to Head Teachers and their staff, so that approval in principle does not oblige any particular establishment to take part.

I request that you forward a copy of your completed findings to me when they become available. In this case an electronic summary of your thesis would be preferred. Your work may be of interest to a number of staff in the Communities and Families Department.

I would like to thank you for contacting the Communities and Families Department about your work, and wish you every success in the completion of your project.

Yours sincerely

Martin Gammell
Principal Psychologist

Psychological Services, Communities and Families
Level 1.3 Waverley Court, 4 East Market Street, Edinburgh EH8 8BG
Tel 0131 469 2803   E-mail anne.fitzpatrick@ea.edin.sch.uk

INVESTORS IN PEOPLE | Gold
We are inviting you to take part in a research study on young people's mental health and the treatment they receive. This sheet gives you some information about the study so that you can choose whether you want to take part or not. If there is anything else that you would like to know, or if there is something that is not clear, please speak with the clinician who you are working with in CAMHS or you can arrange to have a call with the researchers.

**Why are we doing this study?**

We are interested in looking at mental health in adolescents’ daily lives and how young people respond to stressors. We are interested in learning about factors associated with the development and maintenance of mental health difficulties and what things change when you have treatment in CAMHS. We are also interested in looking at the impact of the covid-19 pandemic and the transition out of lockdown on young people’s mental health and treatment. We would like to find out more about this by asking young people aged 12-18 to complete some online questionnaires. We would also ask you take part in a week of data collection by downloading an app on your phone which will send you a notification several times a day and ask you to complete a short survey that takes around 60-90 seconds.

**Who can take part?**

You can take part if you are aged between 12-18 years old, are currently receiving treatment in CAMHS and are able and willing to take part. Your parents will also be told about this research study.

**Do I have to take part?**

No! It’s completely up to you and choosing not to take part won’t affect you in any way.

**Can I change my mind?**
Yes! Even if you say yes now you can decide to stop taking part at any time you want. You don’t have to tell the researchers or the clinician you are working with in CAMHS why you want to stop if you don’t want to. You should note that the answers you have already given on questionnaires and the app may be used to produce reports such as journal articles and conference presentations before you withdraw and so you should contact the research team as soon as you can if you want to withdraw from the study. You can stop being part of the study at any time, without giving a reason. Deciding not to take part or withdrawing from the study will not affect your healthcare or treatment at CAMHS in any way.

**What does the study involve?**

In this study, you will be asked to complete some online questionnaires. You will then download an app on your phone which will send you notifications at different times of the day asking you to complete a short 60-90 second questionnaire. This will take place over a week. The questions will focus on how you are feeling, what is happening and what you are doing. This helps us to get an understanding of mental health and wellbeing in your everyday life.

If you are interested in taking part, please let your clinician in CAMHS know or contact the research team using the contact details at the end of this information sheet. We will then arrange a call with you to answer any questions you have about the study. We will ask you to sign an online consent form to show that you want to participate in the research. It’s ok to say no or change your mind later on. If your parent/ caregiver decides that they would not like you to participate in this research, they can complete an opt out form meaning that you would not be able to continue with the study.

We will then show you how to download and use an app on your phone. Here is a link to the app if you would like to read a bit more about it and see what it looks like: [https://m-path.io/landing/](https://m-path.io/landing/). During this call you can practice using the app and ask any questions that you have.

After this phone call, you will be asked to fill out five brief online questionnaires on demographics (e.g. age, gender, ethnicity) as well as mental health and wellbeing (your mood and feelings) at a time that works for you. Some of these questions
might be a bit hard to answer, but you are welcome to leave out any questions that you don’t want to answer.

You will then complete the week of data collection using the app. If any problems arise during this time you can always get in touch with the researcher using the contact details given at the end of this information sheet.

We will ask you to carry your phone with you for a week. During that time a notification will come up on your phone multiple times a day between 7am and 10.30pm and you will be asked to fill in a short survey questionnaire about what is going on at that time, what you are doing and how you are feeling. This shouldn’t take any longer than 60-90 seconds to complete. We can schedule these notifications so that they do not go off when you are in class. We can also change the time that the notifications start in the morning and stop in the evening depending on when you usually wake up and go to sleep. You can select the day that you would like to start.

If you become distressed during the questionnaires or app data collection, you can stop completing that set of questions or stop with the study entirely. If this does happen, we would encourage you to speak with your CAMHS team, a trusted adult or access support from the helplines listed at the end of this information sheet. Please note that, to ensure your safety and wellbeing, if you score on a risk related measure the researcher will inform your CAMHS team.

As well as asking you questions about how you are feeling, what you are doing and what is happening around you, the app will also collect some broad data about how you interact with your mobile phone and about your activity levels. Data will be collected on how often and for how long you use certain apps on your phone, your activity levels (e.g. step count) and how much time you spend using your phone. This allows for us to look at the relationship between social media, mobile phones and activity levels and mental health and if this changes as lockdown restrictions change. The app you will download and use on your phone will only collect data on your physical activity level and data on how long the app is open. No content from the apps on your phone will be collected.
After the week of data collection, you will be given a debrief sheet. You can also opt in to have a phone call with the researcher where you can discuss your experiences and give any feedback that you have.

When the week is over, you can look at your data and share this with the clinician you are working with if you want to. This can be helpful in your sessions. When you are finished with the study you can delete the app from your phone.

You can choose to participate in follow up data collection at the end of your treatment in CAMHS and after two years. You will be asked to complete the same set of questionnaires and data collection on the app. This allows us to see if and how things change over time. Participation in this is optional, you can let us know in the consent form if you would like to opt out of follow up data collection. If you decide that you would like to participate in follow up data collection, we would like to contact you at 6 month intervals to check if you are still being seen in CAMHS, whether you would still like to participate in follow up data collection and your contact details. We would ask that you or your clinician in CAMHS let the research team know when your treatment in CAMHS has come to an end so that we know follow up data collection can begin.

**What happens if the app stops working?**

Don’t worry if this happens. You can contact the researcher to let them know and they will help fix this.

**What are the possible benefits?**

You will have access to the questionnaire data on the app. You can share this with clinician if you choose to and you could use this information in sessions. This could allow you and your clinician to have a clearer understanding of your thoughts and feelings across the week and triggers for any changes in your mood.

By taking part in this study and sharing your experience with us, you will be helping the research team to better understand the factors that influence mental health difficulties and positive treatment outcomes in CAMHS. Treatments can be developed and adapted based on this information.

You will be awarded a £5 shopping voucher as compensation for taking part in this study. You can let us know if you would like to receive this £5 voucher or not. You
can still take part even if you do not want to receive the voucher. You can let us know within the online survey.

**Are there any risks associated with taking part?**

There are no major risks of taking part in this study. It will take a bit of time and some of the questions asked are related to your mental health. It is possible that you might find some of those questions distressing. If you do, you will be able to discuss this in sessions with the clinician you are seeing in CAMHS.

**Data protection and confidentiality**

The NHS will manage your identifiable information (your “personal data”) as you are participating in a study conducted by a research team working at both NHS Lothian and the University of Edinburgh. We will ask for your consent to let your GP know that you are participating in this study.

We will keep your answers private. Your data will be referred by a unique participant number rather than by name. Your data will be only viewed by the research team. We won’t put your name, address or school on the survey or anything else that would mean people would know it was you. We will also store digital data on secure password-protected computers within the University of Edinburgh. The app won’t store any personal identifiable information or information about our study. The responses you give on the questionnaire will be stored securely by an external company (KU Leuven Research and Development based in Belgium). If your phone gets lost or stolen, you can get in touch with the research team who can ensure that any data on the app can be deleted remotely.

We will write up the results and publish them in an academic journal. We will also share the results with your CAMHS team so you can see what we found out in the form of a generic report. We will keep personal data for 12 months after the study has finished. We will store your anonymised data for 5 years after the study has been completed.

If you disclose any information that suggests that you or someone else is at risk of harm, we will share confidential information you provided with others (e.g. the Police, the parents, social services, or other teachers) and we may need to follow the school child protection guidance to ensure safety and wellbeing. These are situations where
confidentiality would have to be breached, in order to ensure that you are able to obtain support if necessary, and to ensure your safety going forward. If this was necessary, we would always try to let you know first.

**How will we use information about you?**

We will need to use information from you for this research project. This information will include your initials, name and contact details. People will use this information to do the research. If you consent to participating in follow up data collection at the end of your treatment in CAMHS and after 2 years, we would ask you to provide your contact details and contact details of a trusted other and ask you to update us on any changes of contact details so that we don’t lose touch with you.

If you consent to participating in follow up data collection, researchers will have access to service level data on your medical records so that they know when you have been discharged from CAMHS. They will use this information to know when end of treatment data collection can be started.

People who do not need to know who you are will not be able to see your name or contact details. Your data will have a code number instead.

We will keep all information about you safe and secure.

Once we have finished the study, we will keep some of the data so we can check the results. We will write our reports in a way that no-one can work out that you took part in the study.

If you want to take part in the prize draw, we will also use the contact details you provide to let you know if you have won. These contact details can be from our first discussion by telephone or email, or you can provide other contact details if you wish. These contact details will be stored on a file within an NHS server, separate from the study data. The contact details will be destroyed once the prize draw is complete, unless you have also consented to follow-up data collection.

**What are your choices about how your information is used?**
• You can stop being part of the study at any time, without giving a reason, but we will keep information about you that we already have.

• We need to manage your records in specific ways for the research to be reliable. This means that we won’t be able to let you see or change the data we hold about you.

• If you agree to take part in this study, you will have the option to take part in future research using your data saved from this study. With your consent, your anonymised data will be uploaded to Edinburgh DataShare.

**Where can you find out more about how your information is used?**

You can find out more about how we use your information

• at [www.hra.nhs.uk/information-about-patients/](http://www.hra.nhs.uk/information-about-patients/)

• by asking one of the research team and sending an email to Jordan Bibby

• [https://www.ed.ac.uk/records-management/privacy-notice-research](https://www.ed.ac.uk/records-management/privacy-notice-research)

**What will happen to the results of the study?**

This study will be written up as a thesis for a doctorate in Clinical Psychology and a publication that is submitted to a Peer Reviewed Journal. You will not be identifiable from any published results.

When we have finished this project, we would like to give other researchers the chance to use the anonymised data we have collected to answer their own questions. We wouldn’t share any personal information about you with these researchers, like your name or your school, only questionnaire scores that people would not be able to tell was yours. You can tell us if you don’t want us to share your answers with other researchers on the consent form.

If you would like to see a summary of this study’s findings once the research has been completed, please tick the appropriate box on the consent form and this can be sent to you.
Who has reviewed the study?

All research in the NHS is looked at by an independent group of people called a Research Ethics Committee. A favourable ethical opinion has been obtained from the East of Scotland Research Ethics Committee. NHS Management Approval has also been given.

Who can I speak to about the study?

If you have any questions about the study, you can ask the clinician that you are working with in CAMHS. If you want to get in touch with the research team directly you can speak to Jordan Bibby ( ).

If something goes wrong and you want to complain about this study, you can contact Ruth Jepson ( ) who is the Director of Research, School of Health in Social Science at the University of Edinburgh.

Thank you for reading about our study!

If you would like to take part, please discuss this with your clinician in your next appointment at CAMHS or get in touch with the research team directly using the contact details provided above.

Helplines support

If you feel distressed or there are still things you may want to discuss your feelings and emotions, please contact the services listed below.

They are confidential and free helplines open 24 hours and can assist you in an emergency or crisis.
<table>
<thead>
<tr>
<th>Service</th>
<th>Phone Number</th>
<th>Opening Hours</th>
<th>What help does it provide?</th>
</tr>
</thead>
<tbody>
<tr>
<td>NHS 24</td>
<td>111</td>
<td>When GP is not available</td>
<td>Clinical health and mental health support</td>
</tr>
<tr>
<td>Edinburgh Crisis Centre</td>
<td>080 801 0414</td>
<td>24 hours</td>
<td>Mental health support in an emergency or crisis</td>
</tr>
<tr>
<td>The Samaritans</td>
<td>116 123</td>
<td>24 hours</td>
<td>Mental health support in an emergency or crisis</td>
</tr>
<tr>
<td>Mental Health Assessment Service</td>
<td>0131 537 6000</td>
<td>24 hours</td>
<td>Mental health support in an emergency or crisis</td>
</tr>
<tr>
<td>ChildLine Scotland</td>
<td>0800 1111</td>
<td>Anytime</td>
<td>Mental health support in a crisis. Help if you need someone to talk to</td>
</tr>
<tr>
<td>Breathing Space</td>
<td>0800 83 85 87</td>
<td>6pm-2am Monday to Thursday, 6pm-6am Friday to Monday morning</td>
<td>Help if you are experiencing low mood or depression and need someone to talk to</td>
</tr>
</tbody>
</table>
You can view the information sheets for this study online

To view this study online please either:

- follow this link:

  https://edinburgh.eu.qualtrics.com/jfe/form/SV_2ry6Ojv4nB9YIv4

- scan this QR code using the camera on your phone:

  ![QR code]

You will be asked to complete the consent forms and questionnaires for this study online using this link or QR code.
**STUDY INFORMATION**

We are inviting you to take part in a research study on young people’s mental health and the treatment they receive. This sheet gives you some information about the study so that you can choose whether you want to take part or not. If there is anything else that you would like to know, or if there is something that is not clear, please speak with the clinician who you are working with in CAMHS or you can arrange to have a call with the researchers.

**Why are we doing this study?**

We are interested in looking at mental health in adolescents’ daily lives and how young people respond to stressors. We are interested in learning about factors associated with the development and maintenance of mental health difficulties and what things change when you have treatment in CAMHS. We are also interested in looking at the impact of the covid-19 pandemic and the transition out of lockdown on young people’s mental health and treatment. We would like to find out more about this by asking young people aged 12-18 to complete some online questionnaires. We would also ask you take part in a week of data collection by downloading an app on your phone which will send you a notification several times a day and ask you to complete a short survey that takes around 60-90 seconds.

**Who can take part?**

You can take part if you are aged between 12-18 years old, are currently receiving treatment in CAMHS and are able and willing to take part.

**Do I have to take part?**

No! It’s completely up to you and choosing not to take part won’t affect you in any way.
Can I change my mind?

Yes! Even if you say yes now you can decide to stop taking part at any time you want. You don't have to tell the researchers or the clinician you are working with in CAMHS why you want to stop if you don't want to. You should note that the answers you have already given on questionnaires and the app may be used to produce reports such as journal articles and conference presentations before you withdraw so you should contact the research team as soon as you can if you want to withdraw from the study. You can stop being part of the study at any time, without giving a reason. Deciding not to take part or withdrawing from the study will not affect your healthcare or treatment at CAMHS in any way.

What does the study involve?

In this study you will complete some online questionnaires and complete 60-90 second survey on an app on your phone multiple times a day for a week. The app will send you notifications to remind you to do this. The questions will focus on how you are feeling, what is happening and what you are doing. This helps us to get an understanding of mental health and wellbeing in your everyday life.

If you are interested in taking part, please let your clinician in CAMHS know or contact the research team using the contact details at the end of this information sheet. We will then arrange a call with you to answer any questions you have about the study. We will ask you to sign an online consent form to show that you want to participate in the research. It's ok to say no or change your mind later on.

We will then show you how to download and use an app on your phone. Here is a link to the app if you would like to read a bit more about it and see what it looks like: https://m-path.io/landing/. During this call you can practice using the app and ask any questions that you have.
After this phone call, you will be asked to fill out five brief online questionnaires on demographics (e.g. age, gender, ethnicity), mental health and wellbeing at a time that works for you. Some of these questions might be a bit hard to answer, but you are welcome to leave out any questions that you don’t want to answer.

You will then complete the week of data collection using the app. If any problems arise during this time you can always get in touch with the researcher using the contact details given at the end of this information sheet.

We will ask you to carry the phone with you for a week. During that time a notification will come up on your phone multiple times a day between 7am and 10.30pm and you will be asked to fill in a short survey questionnaire about what is going on at that time, what you are doing and how you are feeling. This shouldn’t take any longer than 60-90 seconds to complete. If you are at school, we can schedule these notifications so that they do not go off when you are in class. We can also change the time that the notifications start in the morning and stop in the evening depending on when you usually wake up and go to sleep. You can select the day that you would like to start.

If you become distressed during the questionnaires or app data collection, you can stop completing that set of questions or stop with the study entirely. If this does happen, we would encourage you to speak with your CAMHS team, a trusted adult or access support from the helplines listed at the end of this information sheet. Please note that, to ensure your safety and wellbeing, if you score on a risk related measure the researcher will inform your CAMHS team.

As well as asking you questions about how you are feeling, what you are doing and what is happening around you, the app will also collect some broad data about how you interact with your mobile phone and about your activity levels. Data will be collected on how often and for how long you use certain apps on your phone, your activity levels (e.g. step count) and how
much time you spend using your phone. This allows for us to look at the relationship between social media, mobile phones and activity levels and mental health and if this changes as lockdown restrictions change. The app you will download and use on your phone will only collect data on your physical activity level and data on how long the app is open. No content from the apps on your phone will be collected.

After the week of data collection, you will be given a debrief sheet. You can also opt in to have a phone call with the researcher where you can discuss your experiences and give any feedback that you have.

When the week is over, you can look at your data and share this with the clinician you are working with if you want to. This can be helpful in your sessions. When you are finished with the study you can delete the app from your phone.

You can choose to participate in follow up data collection at the end of your treatment in CAMHS and after two years. You will be asked to complete the same set of questionnaires and data collection on the app. This allows us to see if and how things change over time. Participation in this is optional, you can let us know in the consent form if you would like to opt out of follow up data collection. If you decide that you would like to participate in follow up data collection, we would like to contact you at 6 month intervals to check if you are still being seen in CAMHS, whether you would still like to participate in follow up data collection and your contact details. We would ask that you or your clinician in CAMHS let the research team know when your treatment in CAMHS has come to an end so that we know follow up data collection can begin.

**What happens if the app stops working?**

Don't worry if this happens. You can contact the researcher to let them know and they will help fix this.
What are the possible benefits?

You will have access to the questionnaire data on the app. You can share this with clinician if you choose to and you could use this information in sessions. This could allow you and your clinician to have a clearer understanding of your thoughts and feelings across the week and triggers for any changes in your mood.

By taking part in this study and sharing your experience with us, you will be helping the research team to better understand the factors that influence mental health difficulties and positive treatment outcomes in CAMHS. Treatments can be developed and adapted based on this information.

You will be awarded a £5 shopping voucher as compensation for taking part in this study. You can let us know if you would like to receive this £5 voucher or not. You can still take part even if you do not want to receive the voucher. You can let us know within the online survey.

Are there any risks associated with taking part?

There are no major risks of taking part in this study. It will take a bit of time and some of the questions asked are related to your mental health. It is possible you find that distressing. If you do, you will be able to discuss this in sessions with the clinician you are seeing in CAMHS.

Data protection and confidentiality

The NHS will manage your identifiable information (your “personal data”) as you are participating in a study conducted by a research team working at both NHS Lothian and the
Investigating psychological predictors of distress and mechanisms of change in mental health treatment in adolescents

University of Edinburgh. We will ask for your consent to let your GP know that you are participating in this study.

We will keep your answers private. Your data will be referred by a unique participant number rather than by name. Your data will be only viewed by the research team. We won’t put your name, address or school on the survey or anything else that would mean people would know it was you. We will also store digital data on secure password-protected computers within the University of Edinburgh. The app won’t store any personal identifiable information or information about our study. The responses you give on the questionnaire will be stored securely by an external company (KU Leuven Research and Development based in Belgium). If your phone gets lost or stolen, you can get in touch with the research team who can ensure that any data on the app can be deleted remotely.

We will write up the results and publish them in an academic journal. If you would like to receive a summary of the results of the study once it is completed, please tick the appropriate box on the consent form. We will keep personal data for 12 months after the study has finished. We will store your anonymised data for 5 years after the study has been completed.

If you disclose any information that suggests that you or someone else is at risk of harm, we will share confidential information you provided with others (e.g. the Police, the parents, social services, or other teachers) and we may need to follow the school child protection guidance to ensure safety and wellbeing. These are situations where confidentiality would have to be breached, in order to ensure that you are able to obtain support if necessary, and to ensure your safety going forward. If this was necessary, we would always try to let you know first.

**How will we use information about you?**

We will need to use information from you for this research project.
Investigating psychological predictors of distress and mechanisms of change in mental health treatment in adolescents

This information will include your name and contact details (phone number and email address). People will use this information to do the research. If you consent to participating in follow up data collection at the end of your treatment in CAMHS and after 2 years, we would ask you to provide your contact details and contact details of a trusted other and ask you to update us on any changes of contact details so that we don’t lose touch with you.

If you consent to participating in follow up data collection, researchers will have access to service level data on your medical records so that they know when you have been discharged from CAMHS. They will use this information to know when end of treatment data collection can be started.

People who do not need to know who you are will not be able to see your name or contact details. Your data will have a code number instead.

We will keep all information about you safe and secure.

Once we have finished the study, we will keep some of the data so we can check the results. We will write our reports in a way that no-one can work out that you took part in the study.

If you want to take part in the prize draw, we will also use the contact details you provide to let you know if you have won. These contact details can be from our first discussion by telephone or email, or you can provide other contact details if you wish. These contact details will be stored on a file within an NHS server, separate from the study data. The contact details will be destroyed once the prize draw is complete, unless you have also consented to follow-up data collection.

What are your choices about how your information is used?

- You can stop being part of the study at any time, without giving a reason, but we will keep information about you that we already have.
We need to manage your records in specific ways for the research to be reliable. This means that we won’t be able to let you see or change the data we hold about you.

If you agree to take part in this study, you will have the option to take part in future research using your data saved from this study. With your consent, your anonymised data will be uploaded to Edinburgh DataShare.

Where can you find out more about how your information is used?

You can find out more about how we use your information

- at www.hra.nhs.uk/information-about-patients/
- by asking one of the research team and sending an email to Jordan Bibby
  (https://www.ed.ac.uk/records-management/privacy-notice-research)

What will happen to the results of the study?

This study will be written up as a thesis for a doctorate in Clinical Psychology and a publication that is submitted to a Peer Reviewed Journal. You will not be identifiable from any published results.

When we have finished this project, we would like to give other researchers the chance to use the anonymised data we have collected to answer their own questions. We wouldn’t share any personal information about you with these researchers, like your name or your school, only questionnaire scores that people would not be able to tell was yours. You can tell us if you don’t want us to share your answers with other researchers on the consent form.

If you would like to see a summary of this study’s findings once the research has been completed, please tick the appropriate box on the consent form and this can be sent to you.
Investigating psychological predictors of distress and mechanisms of change in mental health treatment in adolescents

Who has reviewed the study?

All research in the NHS is looked at by an independent group of people called a Research Ethics Committee. A favourable ethical opinion has been obtained from the East of Scotland Research Ethics Committee. NHS Management Approval has also been given.

Who can I speak to about the study?

If you have any questions about the study, you can ask the clinician that you are working with in CAMHS. You can also speak to the research team directly (email: ).

If something goes wrong and you want to complain about this study, you can contact Ruth Jepson ( ) who is the Director of Research, School of Health in Social Science at the University of Edinburgh.

Thank you for reading about our study!

If you would like to take part, please discuss this with your clinician in your next appointment at CAMHS or get in touch with the research team directly using the contact details provided above.
Helplines support

If after completion of the survey you feel distressed or there are still things you may want to discuss your feelings and emotions, please contact the services listed below. They are confidential and free helplines open 24 hours and can assist you in an emergency or crisis.

<table>
<thead>
<tr>
<th>Service</th>
<th>Phone Number</th>
<th>Opening Hours</th>
<th>What help does it provide?</th>
</tr>
</thead>
<tbody>
<tr>
<td>NHS 24</td>
<td>111</td>
<td>When GP is not available</td>
<td>Clinical health and mental health support</td>
</tr>
<tr>
<td>Edinburgh Crisis Centre</td>
<td>080 801 0414</td>
<td>24 hours</td>
<td>Mental health support in an emergency or crisis</td>
</tr>
<tr>
<td>The Samaritans</td>
<td>116 123</td>
<td>24 hours</td>
<td>Mental health support in an emergency or crisis</td>
</tr>
<tr>
<td>Mental Health Assessment Service</td>
<td>0131 537 6000</td>
<td>24 hours</td>
<td>Mental health support in an emergency or crisis</td>
</tr>
</tbody>
</table>
Investigating psychological predictors of distress and mechanisms of change in mental health treatment in adolescents

<table>
<thead>
<tr>
<th>ChildLine Scotland</th>
<th>0800 1111</th>
<th>Anytime</th>
<th>Mental health support in a crisis. Help if you need someone to talk to</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breathing Space</td>
<td>0800 83 85 87</td>
<td>6pm-2am Monday to Thursday, 6pm-6am Friday to Monday morning</td>
<td>Help if you are experiencing low mood or depression and need someone to talk to</td>
</tr>
</tbody>
</table>
You can view the information sheets for this study online

To view this study online please either:

- follow this link:

  https://edinburgh.eu.qualtrics.com/jfe/form/SV_2ry6Ojv4nB9Y1v4

- scan this QR code using the camera on your phone:
You will be asked to complete the consent forms and questionnaires for this study online using this link or QR code

**STUDY INFORMATION**

We would like to invite your child to take part in this research study. This sheet gives you some information about the study so that you can decide whether you are happy for your child to take part. If there is anything else that you would like to know, or if there is something that is not clear, please speak with the clinician who is working with your child in CAMHS or you can contact the research team directly.

**Why are we doing this study?**

We are interested in looking at mental health in adolescents’ daily lives and how they respond to stressors. We are interested in learning about the factors associated with the development and maintenance of mental health difficulties and what things change during treatment in CAMHS. We are also interested in looking at the impact of the covid-19 pandemic and the transition out of lockdown on young people’s mental health and treatment. We would like to find out more about this by asking your child to complete some online questionnaires. We would also ask them take part in a week of data collection by downloading an app on their phone and completing short a short survey that takes around 60-90 seconds several times a day.
Who can take part?

Young people can take part if they are aged between 12-18 years old, are currently receiving treatment in CAMHS and are able and willing to take part. We will present this study to them and seek their written consent to participate.

Does my child have to take part?

No! It’s completely up to you and your child. Choosing not to take part won’t affect them in any way.

Can they change their mind?

Yes! Even if your child says yes now they can decide to stop taking part at any time they want. They don’t have to give a reason about why they want to stop if they don’t want to. You should note that your child’s data may be used to produce formal research outputs such as journal articles, conference papers, theses, and reports prior to their withdrawal and so you or your child are advised to contact the research team at the earliest opportunity should you wish to withdraw your child from the study.

Deciding not to take part or withdrawing from the study will not affect your child’s healthcare or treatment at CAMHS in any way.

What does this study involve?

In this study, your child will complete some online questionnaires and complete a 60-90 second survey on an app on their phone multiple times a day for a week. This helps us to get an understanding of their mental health and wellbeing in their everyday life.

If you decide that you are happy for your child to take part, you won’t have to do anything. It’s ok to opt your child out of this research. You can choose to opt them out now or change your mind later. If you would not like for your child to participate in this research, you can fill in the opt out form and they will be removed from the study. Even if your child has completed the consent form indicating that they would like to participate, if you decide you do not want them to they will be opted out of the research.

If your child is interested in taking part, we have asked them to let their clinician in CAMHS know or contact the research team using the contact details at the end of
this information sheet. We will then arrange a call with them to answer any questions you or your child may have about the study. We will ask them to sign an online consent form to show that they want to participate in the research. It’s ok for them to say no now or change their mind later.

We will then show them how to download and use an app on their phone. Here is a link to the app if you would like to read a bit more about it and see what it looks like: https://m-path.io/landing/. During this call they can practice using the app and ask any questions that they have.

After this phone call, they will be asked to fill out some online questionnaires on demographics, mental health and wellbeing at a time that suits them. Some of these questions might be a bit hard to answer, but they are welcome to leave out any questions that they don’t want to answer.

Your child will then complete the week of data collection using the app. If any problems arise during this time you or your child can always get in touch with the researcher using the contact details given at the end of this information sheet.

We will ask them to carry the phone with them for a week. During that time a ‘beep’ notification will go off multiple times a day between 7am and 10.30pm and they will be asked to fill in a short questionnaire about what is going on at that time, what they are doing and how they are feeling. This takes between 60-90 seconds to complete. We can schedule these alerts to go off after class if you are worried about it interfering with school. We can also change the time that the notifications start in the morning and stop in the evening depending on when they usually wake up and go to sleep. They can select the day that they would like to start.

Please note that, to ensure their safety and wellbeing, if they score on a risk related measure the researcher will inform your child’s CAMHS team. Should they become distressed during the data collection, we have encouraged them to get in touch with their CAMHS team, speak with a trusted adult or access support from the helplines given at the end of their information sheet.

As well as asking questions about how they are feeling, what they are doing and what is happening around them, the app will also collect some broad data about how they interact with their mobile phone and about their activity levels. Data will be
collected on how often and for how long they use certain apps on their phone, their activity levels (e.g. step count) and how much time they spend using their phone. This allows us to look at the relationship between social media, mobile phones and activity levels and mental health and if this changes as lockdown restrictions change. The app will only collect data on your physical activity level and how long apps are open for. No content from the apps on their phone will be collected.

After the week of data collection, they will be given a debrief sheet. They can also opt in to have a phone call with the researcher where they can discuss how they got on and give any feedback that they have.

When the week is over, they can look at their data and share this with the clinician they are working with if you want to. This can be helpful in their sessions. When they are finished with the study they can delete the app from their phone.

Your child can participate in follow up data collection at the end of their treatment in CAMHS and after two years. This allows us look at therapeutic progress and to see if and how things change over time. Participation in this is optional, they can let us know in the consent form if they would like to opt out of follow up data collection. If they decide that they would like to participate in follow up data collection, we would like to contact them at 6 month intervals to check if they are still being seen in CAMHS, whether they would still like to participate in follow up data collection and their contact details. We would ask that you, your child or their clinician in CAMHS let the research team know when their treatment ends so that we know when follow up data collection can begin.

**What happens if the app stops working?**

Don’t worry if this happens. Don’t worry if this happens. You or your child can contact the researcher to let them know and they will help fix this.

**What are the possible benefits?**

Your child will have access to the questionnaire data on the app and they can use this therapeutically in sessions. They can share this with their clinician if they choose to and they could use this information in sessions. This could allow your child and
your clinician to have a clearer understanding of their thoughts and feelings across the week and triggers for any changes in their mood.

By your child taking part in this study and sharing their experience with us, they will be helping the research team to better understand the factors that influence positive treatment outcomes in CAMHS. Treatments can be developed and adapted based on this information.

Your child will be awarded a £5 shopping voucher as compensation for participation in this study. You can let us know if you would like your child to receive this £5 voucher via the online consent form. Your child will still be able to take part in the study even if you do not wish for them to receive payment.

**Are there any risks associated with taking part?**

There are no significant risks associated with participation. During the data collection week, it will take a bit of your child’s time. Some of the questions they are being asked are related to their mental health and it is possible that they might find these distressing. If they do, they will be able to follow the advice they have been given in CAMHS to manage difficult emotions and also discuss this in the sessions they are having at CAMHS.

**Data protection and confidentiality**

We will keep your child’s answers private. Your child’s data will be referred by a unique participant number rather than by name. Your child’s data will be only viewed by the research team. We won’t put your child’s name, address or school on the survey or anything else that would mean people would know it was you. We will store digital data on secure password-protected computers within the University of Edinburgh. The app won’t store any personal identifiable information or information about our study. The responses your child gives on the questionnaire will be stored securely by an external company (KU Leuven Research and Development based in Belgium). If your child’s phone gets lost or stolen, you or your child can get in touch with the research team who can ensure that any data on the app can be deleted remotely.
We will write up the results and publish them in an academic journal. We will also share the results with your CAMHS team so you can see what we found out in the form of a generic report.

We will keep identifiable data for 12 months after the study has finished. We will store your child’s anonymised data for 5 years after the study has been completed.

If your child discloses any information that suggests that they or someone else is at risk of harm, we will share this information with appropriate third parties (e.g. emergency services, child protection etc.) to ensure safety and wellbeing. Where possible, we will notify your child that we are going to do this first.

**How will we use information about your child?**

We will need to use information from your child for this research project.

This information will include their initials, name and contact details. People will use this information to do the research. If they consent to participating in follow up data collection at the end of their treatment in CAMHS and after 2 years, we would ask them to provide their contact details and contact details of a trusted other and ask them to update us on any changes of contact details so that we don’t lose touch.

If you consent to your child participating in follow up data collection, researchers will have access to service level data on your child’s medical records so that they know when your child has been discharged from CAMHS. They will use this information to know when end of treatment data collection can be started.

People who do not need to know who your child is will not be able to see your child’s name or contact details. Your child’s data will have a code number instead.

We will keep all information about your child safe and secure.

Once we have finished the study, we will keep some of the data so we can check the results. We will write our reports in a way that no-one can work out that your child took part in the study.
What are your choices about how your information is used?

- Your child can stop being part of the study at any time, without you or them giving a reason
- We need to manage your child’s records in specific ways for the research to be reliable. This means that we won’t be able to let you see or change the data we hold about you child.
- If your child agrees to take part in this study, you and your child will have the option for your child’s anonymised data saved from this study being used in future ethically approved research. With their consent, your child’s anonymised data will be uploaded to Edinburgh DataShare. Even if your child consents to this, you can opt your child out of this part of the study in the opt out form.

Where can you find out more about how your information is used?

You can find out more about how we use your information:

- At [www.hra.nhs.uk/information-about-patients/](http://www.hra.nhs.uk/information-about-patients/)
- By asking one of the research team and sending an email to Jordan Bibby ( )
- [https://www.ed.ac.uk/records-management/privacy-notice-research](https://www.ed.ac.uk/records-management/privacy-notice-research)

What will happen to the results of the study?

This study will be written up for a doctorate thesis and for publication in a journal. Your child will not be identifiable from any published results.

When we have finished this project, we would like to give other researchers the chance to use the data we have collected to answer their own questions. We wouldn’t share any personal information about your child with these researchers, like the name or the school, only questionnaire scores that people would not be able to tell was his/her. You can opt your child out of their data being shared with other researchers on the opt out form.

If your child consents to take part in the prize draw, we will also use the contact details your child provides, from our initial contact, or preferred contact details if otherwise. These contact details will be stored on a file within an NHS server,
separate from the study data. The contact details will be destroyed once the prize draw is complete, unless your child has also consented to follow-up data collection.

**Who has reviewed the study?**

All research in the NHS is looked at by an independent group of people called a Research Ethics Committee. A favourable ethical opinion has been obtained from the East of Scotland Research Ethics Committee. NHS Management Approval has also been given.

**Who can I speak to about the study?**

If you have any questions about the study, you can the clinician that you are working with in CAMHS. If you want to get in touch with the research team directly you can speak to Jordan Bibby (email: ).

If something goes wrong and you want to complain about this study, you can contact Ruth Jepson ( ) who is the Director of Research, School of Health in Social Science at the University of Edinburgh.

Thank you for reading about our study.

**If you are happy for your child to take part, you do not need to anything. If you would not like your child to take part in this research, please request a copy of and fill in the opt out form.**

**Helplines support**

If after completion of the survey you feel distressed or there are still things you may want to discuss your feelings and emotions, please contact the services listed below.
They are confidential and free helplines open 24 hours and can assist you in an emergency or crisis.

<table>
<thead>
<tr>
<th>Service</th>
<th>Phone Number</th>
<th>Opening Hours</th>
<th>What help does it provide?</th>
</tr>
</thead>
<tbody>
<tr>
<td>NHS 24</td>
<td>111</td>
<td>When GP is not available</td>
<td>Clinical health and mental health support</td>
</tr>
<tr>
<td>Edinburgh Crisis Centre</td>
<td>080 801 0414</td>
<td>24 hours</td>
<td>Mental health support in an emergency or crisis</td>
</tr>
<tr>
<td>The Samaritans</td>
<td>116 123</td>
<td>24 hours</td>
<td>Mental health support in an emergency or crisis</td>
</tr>
<tr>
<td>Mental Health Assessment Service</td>
<td>0131 537 6000</td>
<td>24 hours</td>
<td>Mental health support in an emergency or crisis</td>
</tr>
<tr>
<td>ChildLine Scotland</td>
<td>0800 1111</td>
<td>Anytime</td>
<td>Mental health support in a crisis. Help if you need someone to talk to</td>
</tr>
<tr>
<td>Breathing Space</td>
<td>0800 83 85 87</td>
<td>6pm-2am Monday to Thursday, 6pm-6am Friday to Monday morning</td>
<td>Help if you are experiencing low mood or depression and need someone to talk to</td>
</tr>
</tbody>
</table>

You can view the information sheets for this study online

To view this study online please either:

- follow this link:
  
  [https://edinburgh.eu.qualtrics.com/jfe/form/SV_2ry6Ojv4nB9YIv4](https://edinburgh.eu.qualtrics.com/jfe/form/SV_2ry6Ojv4nB9YIv4)

- scan this QR code using the camera on your phone:
You will be asked to complete the consent forms and questionnaires for this study online using this link or QR code.
Appendix E
School Information Sheet and Consent Form and Flyer

STUDY INFORMATION

Investigating the Interpersonal and Contextual Factors involved in Adolescents’ Mental Health

We would like to invite your school to take part in a research study. This sheet gives you some information about this study. If there’s anything else you would like to know, or something that isn’t clear, please ask the researchers using the contact details below:

Simona Di Folco, email: , tel. (+44) 131 513918.
Jordan Bibby, email: , tel. (+44) 7929 784 332.

Why are we doing a study?

This project aims to understand the interpersonal and contextual processes that occur in the lives of adolescents that contribute to mental health and wellbeing, and to investigate the protective factors that also play a role to promote resilience.

Who can take part?

We would like to work with a wide range of schools, so any secondary school in Scotland is welcome to work with us on this project. We are aiming to work with young people between the ages of 12 and 16 and who are deemed by a suitable member of school staff to have the ability to understand the study procedures. We will advertise the study using posters in the school and we are also happy to visit your school and tell your students about our study.

What do we need from your School?

Before we start, we would need you to contact the Guidance Teacher and talk to them about their availability to be a reference person whom children and young people can talk to if they wish to, whilst or after taking part in the project.

We may also need a separate room in case we may need to talk to young people in private on the day of data collection or straight after.
What does this study involve?

We will liaise with you to find good times to visit your school and explain the study to young people. Participation in this study will involve three parts. Your school can decide whether to participate in the first part but not in the second or whether you participate in both. A pupil's data will be used in analyses for any part they, and/or their parents', consent to. For the third part of the study, we will link data on mental health and wellbeing collected from the survey administered in the first part, with data collected in the second part of the study. Please see further details on each part of the study below.

For the **first part** of the study, we will come to your school and ask young people to fill out a survey on mental health and wellbeing. This includes questions about mood, relationships with parents and peers, risky behaviour (like taking drugs), whether they have harmed themselves before and whether they have experienced difficult things in childhood, like being hurt by an adult who is caring for them or being approached in an inappropriate sexual way. Some of these questions might be quite hard to answer, but young people are welcome to leave out any questions that they don’t want to respond to, and we will be present along with staff to support young people.

For the **second part** of the study, we will ask young people to download an app, named ‘m-path Sense’, on their phone (we will provide one if they do not have a device) and use it for a week. During that time, an alert on the mobile phone will go off 10 times per day and it will ask them to fill in a short survey about what is going on at that moment and how they are feeling. Additionally, the app will collect data on number of steps/physical activity and screen activity (on/off/unlocked and time spent on apps). During classes, the alert will go off at a set time to minimise the disruption this will cause. You will be informed of these set times before the week of data collection begins. We ask that any young people involved can have access to the phones during this week. After that we will come back to your school and pick up the phone if we have lent some to young people for research purposes.

For the **third part** of the study, we will link the data from the survey to the data collected in everyday life through the m-Path app. Participants will not need to do anything for this part of the study. If a young person and/or parent consents to this, we will contact them 6 months after the completion of the study to ask some questions again relating to their mental health and well-being. This will help us understand if anything has changed over this time.

You can request a copy of the survey from the research team using the contact details below if you wish. Trained researchers will be present during the downloading of the app, to clarify instructions and answer any questions. Researchers will be contactable by telephone and email (provided in this sheet) during the week of data collection through the m-Path app.

What about young people’s disclosure of self-harm or abuse?
Young people and school staff will be made aware of various supports which they can seek to ensure and promote their safety and well-being. This will include approaching their Guidance Teacher, whom will be informed of the study and contacted by the research team prior to participation. Additionally, members of the research team will be available to offer advice to school staff and/or young people, should there be concerns for a young person’s well-being. However, young people and school staff will be made aware that the research team will not be an emergency contact, and information to contact relevant services will be provided instead. Young people will be made aware, prior to participation, that confidentiality may be broken if they disclose information suggesting that their safety is threatened. In this instance, the young person’s Guidance Teacher will be contacted and informed.

As young people may have these safety-threatening experiences and feel unable to disclose this information, we will encourage them to seek support by:

- **Talking to us** - we will make ourselves available to be reached over the phone, email, and at the school premises on a dedicated day after data collection.
- **talk to the designated Guidance Teacher** - whose name and contact details will be flagged up at the start of data collection. Young people will be made aware of the times when their Guidance Teacher is contactable.
- **talk to any child helplines, healthcare professionals or another trusted adult** - we will provide a leaflet containing detailed advice on the day of data collection.

With the students’ and their parents’ permission, we would also like access to their official school records related to attendance and performance. Each pupil and their parent can tell us if they don’t want us to access their records.

**Does my school have to take part?**

No! It’s completely up to you to decide if this project if right for your school. Choosing not to take part won’t affect you or your pupils in any way.

**Can I change my mind?**

Yes! Even if you decide yes now you can decide to withdraw your school from the project at any time you want. You don’t need to give us a reason for why you want to stop.

**What will happen to the information that you collect?**

The University of Edinburgh is registered as a Data Controller under the Data Protection Act 1998 (the “1998 Act”). The University of Edinburgh upholds the relevant data protection principles and processes all personally identifiable information about you (“personal data”) in accordance with the 1998 Act and other relevant legislation. This research study follows the University of Edinburgh privacy policy. To view this policy which describes the information we collect about you, our security agreement, and your rights, please, see: [https://www.ed.ac.uk/about/website/privacy](https://www.ed.ac.uk/about/website/privacy) If you have any questions about the way the University use a child’s data, please contact the University’s Data
Protection Officer (dpo@ed.ac.uk) or have a look at https://www.ed.ac.uk/data-protection/privacy-notice-research.

Processing a child’s information for this research study is necessary for the outcome of a project carried out in the public interest (GDPR Article 6(1) (e)) and under Article 9(2) (j) necessary for archiving purposes in the public interest, scientific or historical research purposes in accordance with Article 89 (1).

We will keep pupils’ answers private. We won’t put a pupil’s name, address or school on the survey or anything else that could identify them with their data. A unique identifying number will be created for each pupil. This unique ID number will be stored on a separate password protected file and linked to their identifiable information (e.g., contact details, name and date of birth). This file will only be used for follow-up data purposes after 6 months of initial completion of the study, if a child or young person expresses risk of harm to themselves or others during the study, or if they wish to withdraw from the study.

We will keep all data for this project on password-protected computers within the University of Edinburgh and store the consent forms and any identifiable information separately from the data collected as part of the study. We will write up the results and publish them in an academic journal. We will also share the results with you so you can see what we found out and let pupils and their families know. Any identifiable information will be deleted once the study is completed (after part three of the study or after 6 months follow-up, if a participants and parent consents to follow-up contact).

When we have finished this project, we would like to give other researchers the chance to use the data we have collected to answer their own questions. We wouldn’t share any personal information about pupils with these researchers, like their name or their school. The data that we share would be completely anonymous. Each participant can tell us if they don’t want us to share their answers with other researchers when they complete the consent form. We will therefore store the data for a minimum of 5 years.

**Risks of participation (COVID-19)**

We have taken specific steps to minimise the risk of exposure to COVID-19 during the study by adhering to the most up to date Scottish Government guidance. These measures include maintaining 2 metres social distancing; using face coverings if social distancing of 2 metres cannot be maintained, individuals are not stationary or are in a communal space; avoiding crowded places; cleaning hands and surfaces regularly (or local alternative – add as appropriate). Further, any person taking part in the study will only interact with researchers who have experienced no COVID-19 symptoms nor had any known contact with COVID-19 positive individuals for the 14 days prior to the research interaction.

{If there is a participant who is deemed at higher risk, but exceptionally the research is justified as there is either a clinical need or the benefits outweigh the risks, then researchers will have tested negative for COVID-19 in the 7 days prior to the research interaction.}
However, even with these control measures, there remains some additional risk of exposure from participating in this study.

There will also be the option for participation to be completely online. This will be offered for young people who are deemed at higher risk due to COVID-19. This will involve an online workshop facilitated by the presence of an identified schoolteacher and the researchers to support with participation and all materials will also be provided online.

**Storing contact details (off campus)**

If the research requires your pupils to be in contact with the research team in an indoor space out with our university campus, then they may be required to provide their name and contact details to the managers of that space (a responsible body at their School). If there is no requirement by the managers of that space to provide such information, then for the purpose of NHS Test and Protect (or local equivalent) we will request and store your pupils’ name and contact details for 21 days after the research interaction. This will ensure full cover of the typical incubation period and additional time during which people may be infectious, to allow for testing and contact tracing. This information is in addition to the data collected as part of the research study, will be stored separately from the research data (researcher add in local arrangements), shared with NHS Test and Protect if requested, and the legal basis for collecting these data is substantial public interest.

**What if I a student is unwell prior to the research interaction?**

If one of your students feel unwell, experience COVID-19 related symptoms, or has been in contact with a COVID-19 positive individual in the past 14 days, then please contact the researcher (Jordan Bibby, email: , tel. (+44) 7929 784 332), and we will postpone or cancel the research interaction.

**What if a student becomes unwell after the research interaction?**

If one of your students experience COVID-19 related symptoms, and/or has a positive COVID-19 test following the research interaction, please follow the Scotland Government guidance (or local equivalent).

**Who can I speak to about the study?**

If you have any questions about the study, you can get in touch with the research team directly: you can contact Jordan Bibby ( , tel. (+44) 7929 784 332) or Simona Di Folco ( ; (+44) 131 513918). They will be happy to speak to you further about the study either over email or to arrange a time to meet in person or speak on the phone.
If something goes wrong and you want to complain about this study, you can contact Dr Tim Bird, (Email: ) who is Director of Research, School of Health in Social Science. You should complain by filling in this form: https://tinyurl.com/yx3wj45x.

What will my school get in return?

We are happy to explore with you, different options in which we may contribute to your school via educational engagements. At the end of the project, we will provide you:

- a report with the main study findings.
- and will offer an educational workshop on mental health and wellbeing, targeted on your school needs.

We are also open to suggestions for how we can contribute to your school educational engagements.

What do I need to do now?

If you are happy for your school to take part in this study, please complete the permission form and return it to Jordan Bibby ( , tel. (+44) 7929 784 332) or Simona Di Folco ( ).
Investigating the interpersonal and psychosocial origins of young people’s wellbeing in Scotland

This form is directed to a responsible staff member at your school. Please only fill in this form once you have read the information sheet and asked any questions that you have about the study.

School name: ___________________________________

Your name: ___________________________________

Role in school: ___________________________________

Please write your initials in each box if you agree:

<table>
<thead>
<tr>
<th>Statement</th>
<th>Initials</th>
</tr>
</thead>
<tbody>
<tr>
<td>I have read the information sheet for this study</td>
<td></td>
</tr>
<tr>
<td>I am happy for pupils in my school to take part in this study</td>
<td></td>
</tr>
<tr>
<td>I am happy for pupils in my school to take part in the first part of this</td>
<td></td>
</tr>
<tr>
<td>study</td>
<td></td>
</tr>
<tr>
<td>I am happy for pupils in my school to take part in the second part of this</td>
<td></td>
</tr>
<tr>
<td>study</td>
<td></td>
</tr>
<tr>
<td>I am happy for the researchers to access pupils’ school records (optional)</td>
<td></td>
</tr>
<tr>
<td>I am aware that participating in this study at the current time may carry</td>
<td></td>
</tr>
<tr>
<td>risks for pupils in my school in relation to potential exposure to COVID-</td>
<td></td>
</tr>
<tr>
<td>19, and I understand the steps that have been taken in relation to</td>
<td></td>
</tr>
</tbody>
</table>
minimising the risks of exposure and transmission.

Your signature: _________________________________

Today’s date: ______________
Young People's
Day-to-day Mental Health

Advocate for young people's Mental Health?

1 What is this about?

Most mental health problems start from ages 12 to 18. Can you help us understand why this is? We would love your school pupils (12 - 18) to participate in our study looking at young people's mental health during their daily lives.

2 Wellbeing workshops!

If you decide to participate we will provide a wellbeing workshop for your school pupils. These workshops will be tailored to your specific needs and will fit into your current schedule.
wellbeing programme.

3 **If you decide to join**

Your pupils will complete:

- Brief Daily Surveys across 1 week
- Mental Health Questionnaires

4 **When would this happen?**

Data collection and the wellbeing workshops will happen at a time convenient for you and your pupils. We will provide support for the duration of the study and beyond.

5 **Get involved!**

For more information about this study please contact us:

- s1798045@ed.ac.uk [Jordan]
- [Simona] simona.difolco@ed.ac.uk

This research received ethics approval by the City of Edinburgh Council

*Keep Learning, Keep Growing.*
Appendix F

Brochure Instructions for Non-Clinical Participants

Why is this important?
- You participation will help to better understand:
  - What is important to you
  - How you can cope with different events
  - How different experiences have played an important role in your development
  - Highlight the importance of day-to-day wellbeing

- Additionally, the workshops will give you:
  - A space for self-reflection
  - A break to focus in your wellbeing!

## During the Workshop

If you decide to participate in PART 1:
- You will complete some surveys in qualtrics, or you will receive a printed version of the questionnaire.

## Outside the Workshop

If you decide to participate in PART 2:
1. Download m-Path on your phone
2. Provide your unique ID
3. Accept the terms
4. Get your recovery code
5. Add us as a practitioner
6. Complete one week of questions!
### Appendix G

**ESM Item Repository Included in the M-Path Application**

#### Table 1. ESM Item Repository.

<table>
<thead>
<tr>
<th>Domain</th>
<th>Item</th>
<th>Answer options</th>
<th>Rules</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive Affect, High Arousal</td>
<td>Right now I feel...</td>
<td>1 (not at all) - 10 (very much)</td>
<td>NA</td>
<td>Every notification</td>
</tr>
<tr>
<td></td>
<td>(1) Happy</td>
<td>1 (not at all) - 10 (very much)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(2) Enthusiastic</td>
<td>1 (not at all) - 10 (very much)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive Affect, Low Arousal</td>
<td>(3) Relaxed</td>
<td>1 (not at all) - 10 (very much)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(4) Content</td>
<td>1 (not at all) - 10 (very much)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative Affect, High Arousal</td>
<td>(5) Anxious</td>
<td>1 (not at all) - 10 (very much)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(6) Irritated</td>
<td>1 (not at all) - 10 (very much)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative Affect, Low Arousal</td>
<td>(7) Sad</td>
<td>1 (not at all) - 10 (very much)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(8) Insecure</td>
<td>1 (not at all) - 10 (very much)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Additional emotions</td>
<td>Are you experiencing any other emotions right now?</td>
<td>(YES/NO)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Location</td>
<td>(1) Where are you right now?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>----------</td>
<td>-----------------------------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>at work (at school/university)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>at home,</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>at friends’ or families house,</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>in public transport or in a car (passenger seat),</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>somewhere else outside,</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>somewhere else inside</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Main activity</th>
<th>(2) What were you doing just before the beep?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>working/studying</td>
</tr>
<tr>
<td>2</td>
<td>resting/relaxing</td>
</tr>
<tr>
<td>3</td>
<td>everyday chores</td>
</tr>
<tr>
<td>4</td>
<td>errands/shopping</td>
</tr>
<tr>
<td>5</td>
<td>non-active leisure activity (reading, surfing internet, social media, gaming, watching television)</td>
</tr>
<tr>
<td>6</td>
<td>active leisure activity (sports, walking, playing)</td>
</tr>
<tr>
<td>7</td>
<td>I am on the move (walking, driving (passenger seat), public transportation)</td>
</tr>
<tr>
<td>8</td>
<td>I am in a social interaction/conversation</td>
</tr>
<tr>
<td>9</td>
<td>Self-care/hygiene</td>
</tr>
<tr>
<td>10</td>
<td>Eating/Drinking</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Main activity</th>
<th>(3) Do you like what you are doing?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>(not at all) - 10 (very much)</td>
</tr>
</tbody>
</table>

3a. It takes a lot of effort to do this activity
1 (not at all) - 10 (very much)

3b. I would prefer to do something else right now
1 (not at all) - 10 (very much)
<table>
<thead>
<tr>
<th>Social Involvement (4) Are you alone or with others?</th>
<th>1 = alone</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2 = with others physically</td>
</tr>
<tr>
<td></td>
<td>3 = with others online</td>
</tr>
<tr>
<td>(5a) Who is physically present?</td>
<td>1 = romantic partner</td>
</tr>
<tr>
<td></td>
<td>2 = family</td>
</tr>
<tr>
<td></td>
<td>3 = some friend(s)</td>
</tr>
<tr>
<td></td>
<td>4 = colleagues/fellow students</td>
</tr>
<tr>
<td></td>
<td>5 = other acquaintances</td>
</tr>
<tr>
<td></td>
<td>6 = unknown people</td>
</tr>
<tr>
<td>IF (4)= 2 ‘with others’</td>
<td></td>
</tr>
<tr>
<td>(5b) Who are you online with?</td>
<td>1 = romantic partner</td>
</tr>
<tr>
<td></td>
<td>2 = family</td>
</tr>
<tr>
<td></td>
<td>3 = some friend(s)</td>
</tr>
<tr>
<td></td>
<td>4 = colleagues/fellow students</td>
</tr>
<tr>
<td></td>
<td>5 = other acquaintances</td>
</tr>
<tr>
<td></td>
<td>6 = unknown people</td>
</tr>
<tr>
<td>IF (4)= 3 ‘with others online’</td>
<td></td>
</tr>
</tbody>
</table>

| (6a) Right now, I would rather be with others     | 1 (not at all) - 10 (very much) |
| IF (4) = 1 ‘alone’                                |

| (6b) Right now, I feel isolated from others.      | 1 (not at all) - 10 (very much) |
| IF (4) = 1 ‘alone’                                |

| (6c) Right now, I would rather be alone.          | 1 (not at all) - 10 (very much) |
| IF (4) = 2 OR 3 ‘with others’                     |

| (6d) Right now, I feel connected to people I am with | 1 (not at all) - 10 (very much) |
| IF (4) = 2 OR 3 ‘with others’                       |
Event stress/Coping

(1) Has anything important happened to you since the last beep? YES/NO
IF NO = skip to the next set of questions

(2) What happened Free text

2 a. How pleasant was this event? 1 (very unpleasant) 7 (very pleasant)
IF 5-7 skips to next set of questions

2 b. If you found this event stressful, please rate how able you felt to cope with it

1 (not at all) 7 (very much)

(3) Please select how you responded to the situation

1 (not at all) 7 (very much)
IF a 4+ then Adaptive coping strategies:

a. Acceptance e.g. ‘I thought that I have to accept the situation’
b. Planning/Goal directed e.g. ‘I thought about how best I could cope with the situation and what I could do next’
c. Positive reappraisal e.g. ‘I looked for the positive sides of the situation’
d. Positive
refocusing e.g. ‘I thought of or did something nice instead of what happened’
e. Attachment
e.g. ‘I spoke to somebody about the situation/I spent time with others e.1 (Follow-up – was this virtual?)

If a 4 or below

then
Maladaptive coping:

a. RFQ: e.g.
Strong feelings have clouded my thinking
b. Rumination
e.g. I thought about what happened over and over
c. Social withdrawal (dismissive attachment) e.g. ‘I spent time alone and avoided others’
d. Self blame e.g ‘I blamed myself for what happened’
e. Blaming others e.g. ‘I thought it was someone else’s fault’
Attachment (at the time of stressful events)

(1) I feel comfortable to approach others for support right now

1 (not at all comfortable) 7 (very comfortable)

(2) I can trust others right now

1 (not at all) 7 (very much)

Attachment (reflecting on the day)

(1) I felt better when I was around or in contact with others

1 (not at all) 7 (very much)

(2) Overall, I feel others do not understand my problems

1 (Others understand my problems very well) 7 (Others do not understand my problems at all)

IF D5_MaladCoping <= 4
Non-CTIMP Study Protocol

Investigating psychological predictors of stress and mechanisms of change in mental health treatment in adolescents

<table>
<thead>
<tr>
<th>Protocol authors</th>
<th>Emma Martin, Jordan Anthony Bibby, Matthias Schwannauer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chief Investigator</td>
<td>Professor Matthias Schwannauer</td>
</tr>
<tr>
<td>Sponsor number</td>
<td>CAHSS2012/07</td>
</tr>
<tr>
<td>REC Number</td>
<td>21/ES/0043</td>
</tr>
<tr>
<td>Version Number and Date</td>
<td>Version 4, 28/10/2022</td>
</tr>
</tbody>
</table>

The University of Edinburgh and Lothian Health Board
ACCORD
The Queen’s Medical Research Institute
47 Little France Crescent
Edinburgh
EH16 4TJ
# CONTENTS

To update the table of contents, highlight the existing table of contents; right click “update fields” and OK

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>How will we use information about you?</td>
<td>123</td>
</tr>
<tr>
<td>What are your choices about how your information is used?</td>
<td>123</td>
</tr>
<tr>
<td>Where can you find out more about how your information is used?</td>
<td>124</td>
</tr>
<tr>
<td>How will we use information about you?</td>
<td>133</td>
</tr>
<tr>
<td>What are your choices about how your information is used?</td>
<td>134</td>
</tr>
<tr>
<td>Where can you find out more about how your information is used?</td>
<td>135</td>
</tr>
<tr>
<td>How will we use information about your child?</td>
<td>145</td>
</tr>
<tr>
<td>Where can you find out more about how your information is used?</td>
<td>146</td>
</tr>
</tbody>
</table>

1 INTRODUCTION .................................................................................................................. 172

1.1 BACKGROUND ................................................................................................................. 172

1.2 RATIONALE FOR STUDY ............................................................................................... 172

2 STUDY OBJECTIVES ......................................................................................................... 174

2.1 OBJECTIVES .................................................................................................................. 174

2.1.1 Primary Objective .................................................................................................... 174

3 STUDY DESIGN .................................................................................................................. 174

4 STUDY POPULATION ......................................................................................................... 175

4.1 NUMBER OF PARTICIPANTS ......................................................................................... 175

4.2 INCLUSION CRITERIA .................................................................................................... 175

5 PARTICIPANT SELECTION AND ENROLMENT .................................................................. 175

5.1 IDENTIFYING PARTICIPANTS ....................................................................................... 175

5.2 CONSENTING PARTICIPANTS ....................................................................................... 176

5.2.1 Withdrawal of Study Participants ........................................................................... 176

6 STUDY ASSESSMENTS ...................................................................................................... 176

6.1 STUDY ASSESSMENTS .................................................................................................. 176

7 DATA COLLECTION .......................................................................................................... 178

7.1 Source Data Documentation .......................................................................................... 178

8 DATA MANAGEMENT ....................................................................................................... 180

8.1.1 Personal Data ........................................................................................................... 180

The following personal data will be collected as part of the research: demographic data on age, gender and socio-economic status. Participants will sign an online consent form. ........................................................................................................... 180

Data Information Flow ....................................................................................................... 180

8.1.2 Transfer of Data ....................................................................................................... 180

8.1.3 Data Controller ....................................................................................................... 180
The ACCORD Sponsor Representative will assess the study to determine if an independent risk assessment is required. If required, the independent risk assessment will be carried out by the ACCORD Quality Assurance Group to determine if an audit should be performed before/during/after the study and, if so, at what frequency.

Before the study can commence, all required approvals will be obtained and any conditions of approvals will be met.

**Investigator Responsibilities**

- Informed Consent
- Study Site Staff
- Data Recording
- Investigator Documentation
- GCP Training
- Confidentiality
- Data Protection

**Study Conduct Responsibilities**
# LIST OF ABBREVIATIONS

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACCORD</td>
<td>Academic and Clinical Central Office for Research &amp; Development - Joint office for The University of Edinburgh and Lothian Health Board</td>
</tr>
<tr>
<td>CAMHS</td>
<td>Child and Adolescent Mental Health Service</td>
</tr>
<tr>
<td>CI</td>
<td>Chief Investigator</td>
</tr>
<tr>
<td>CRF</td>
<td>Case Report Form</td>
</tr>
<tr>
<td>ESM</td>
<td>Experience Sampling Method</td>
</tr>
<tr>
<td>GCP</td>
<td>Good Clinical Practice</td>
</tr>
<tr>
<td>ICH</td>
<td>International Conference on Harmonisation</td>
</tr>
<tr>
<td>PI</td>
<td>Principle Investigator</td>
</tr>
<tr>
<td>QA</td>
<td>Quality Assurance</td>
</tr>
<tr>
<td>REC</td>
<td>Research Ethics Committee</td>
</tr>
<tr>
<td>SOP</td>
<td>Standard Operating Procedure</td>
</tr>
</tbody>
</table>
1 INTRODUCTION

1.1 BACKGROUND

Adolescence is a critical time for the emergence of mental health problems. The World Health Organisation estimates that 50% of all mental health problems occur by the age of 14 and 75% occur by the age of 18 (ICD-10, 2004). To understand how to tackle these difficulties effectively, a greater understanding of the factors that influence the development and maintenance of these problems in adolescence is needed. It is also vital to understand how and why established treatments work in this age group.

Mentalization, the awareness that we have of our own and other people’s thoughts and feelings and the ability to use this information to understand other people’s behaviour, is something that most people are able to do intuitively. Difficulty with mentalizing is a transdiagnostic factor implicated in the development and maintenance of mental health (MH) difficulties (Bateman and Fonagy, 2004). Research also suggests that coping is another transdiagnostic factor associated with mental health difficulties (Horwitz, Hill and King, 2011). Both of these factors are understood to originate within attachment relationships, early in development and beyond (Bateman & Fonagy, 2004). Adolescents who are struggling with their mental health are seen by CAMHS and may be offered psychological therapy, medication or another type of therapy. We are interested in exploring how the transdiagnostic factors most sensitive to psychological treatment, mentalization, attachment and coping, relate to how adolescents with mental health difficulties respond to stress in their everyday lives, whether reflective functioning and coping develops over the course of their treatment and whether this is associated with reduced everyday stress.

1.2 RATIONALE FOR STUDY

Adolescence is a critical time for the development and treatment of mental health difficulties, with half of all mental health problems emerging by the age of 14 and 75% by the age of 24 (Kessler et al., 2007). As such, early intervention is one of the key recommendations from the Children and Young People’s Mental Health Task Force and has been identified by a priority by the Scottish Government in the Mental Health Strategy 2017-27.

Research suggests that coping, attachment and mentalization are transdiagnostic factors associated with the development and maintenance of mental health difficulties (Luyten et al., 2020; Andro, 2012). There has been limited research into how mentalization, attachment and coping are associated with adolescents with mental health difficulties response to everyday stressors. We are interested in exploring how the transdiagnostic factors most sensitive to psychological treatment, mentalization, attachment behaviours and coping, relate to how adolescents with mental health difficulties respond to stress in their everyday lives, whether reflective functioning and coping develops over the course of their treatment and whether this is associated with reduced everyday stress. No studies so far have focused on whether there are significant improvements in these factors as a result of treatment in CAMHS and how this varies across the type of input the young person receives.

A greater understanding of these questions would further our knowledge and understanding of factors influencing the maintenance of mental health difficulties and what factors influence positive treatment outcomes in both the short and longer term. This would allow for current approaches to treatment to be optimised and holds the possibility of new treatments being developed.
Attachment theory is a comprehensive framework of social and emotional development across the lifespan (Bowlby, 1969, 1973, 1980, 1982) and attachment is understood to be the foundation of mentalization ability (Bateman & Fonagy, 2004). Subsequently, this theory permeates through many psychological models of, and treatments for, mental ill-health. One fundamental premise of attachment theory is that security or insecurity in early key relationships leads to corresponding stable patterns of attachment behaviours throughout life. In turn, these patterns of behaviour shape the experience of the self and others (Gorrese & Rugieri, 2013), cognitive appraisals of threat (Ein-Dor et al., 2011), emotions and affect regulation (Pascuzzo et al., 2015; Brumariu, 2015), physiological response to stress (Kidd et al., 2011) and outcomes of psychological therapy (Taylor et al; 2015; Degnan et al., 2016). However, findings in attachment research come under scrutiny due to methodological limitations in how attachment behaviours have been measured (Ravitz et al., 2010). Another fundamental, but largely ignored, premise of attachment theory, is that it is a ‘person-by-situation’ interactionist framework (Cook, 2000; Campbell & Marshall, 2011; Simpson & Winterheld, 2012). Despite this, patterns of attachment behaviour have primarily been measured at static time points via self-report methods or in laboratory settings with poor applicability to real-life situations. Advances in technology and methodology, such as with experience sampling methodology (ESM), means there can be valid investigation of attachment theory hypotheses, moment-by-moment and in real-life settings.

This study will focus on adolescent mental health, coping and distress. These topics are highly relevant in the current context of the covid-19 pandemic. The pandemic and associated lockdown has resulted in significant and unprecedented changes to our everyday lives. Numerous stressors have arisen as a result of this including school closures, isolation, economic instability, bereavements and ill health. There are high levels of uncertainty and research has suggested that young people have a range of covid-19 related worries. Many go-to coping strategies are not possible due to current restrictions. Furthermore, factors such as phone usage, social media usage and activity levels that are known to be associated with mental health will likely have been affected by lockdown. This study is therefore ideally placed to examine the impact of the covid-19 pandemic and the transition out of lockdown on adolescents mental health and the factors influencing resilience. It is likely that as a result of these stressors demand for mental health support is therefore likely to increase. As a result of the pandemic the delivery of mental health care has had to adapt- with some services halting treatment and others replacing face-to-face appointments with video and telephone contact. This study will also examine the impact of the covid-19 pandemic and the transition out of lockdown on adolescents’ mental health, factors related to emotional wellbeing and treatment outcomes.

This study will look at adolescents who are receiving treatment in CAMHS and take measures of everyday distress, mentalization and coping. Whilst constructs such as mentalization and coping can be measured through cross sectional questionnaires, using an Experience Sampling Method (ESM) to measure everyday affect and distress has greater validity (Myin-Germeys et al., 2018). ESM utilises a structured diary technique as a means of collecting data from human participants in their everyday lives. This approach allows for researchers to get a greater understanding of how an individual’s experience and behaviour interacts with their real life environment. This approach contrasts with standard questionnaires that rely on retrospective recall and minimises the effect of recall bias. This study will use a combination of cross sectional questionnaires and ESM.
2 STUDY OBJECTIVES

2.1 OBJECTIVES

2.1.1 Primary Objective

1) To examine if transdiagnostic factors, mentalization and coping, are associated with adolescents attending CAMHS' response to everyday stressors

2) To examine if there are patterns of attachment behaviour and the use of certain coping styles associated with levels of everyday distress and mental health difficulties in adolescents attending CAMHS

3) To examine if treatment in CAMHS is associated with a change in adolescents' mentalization, attachment behaviours and coping and if these changes are associated with reduced levels of everyday distress

4) To examine the impact of the covid-19 pandemic and the transition out of lockdown on adolescents' mental health and CAMHS treatment

3 STUDY DESIGN

A longitudinal cohort design will be used.

Following ethical approval, information about the study and recruitment will be provided to clinicians in CAMHS teams in the NHS Lothian Health Board. Any young person identified as being eligible for the study by the clinician they are working with will receive an information pack with a detailed description of the study to review. If the child is under aged 15 or under, their parent/ caregiver will also have access to an information pack and consent form with the option of opting their child out of the research. Participants will be informed that consent to participate in this study is on a voluntary basis and they can choose to withdraw from the research at any time with no explanation required. Participants and their caregivers will be informed that patient identifiable information will be stored securely on NHS servers and data collected on the app will be anonymised and stored separately and securely on the University of Edinburgh server, with only trained researchers having access to this.

Adolescents and their caregivers will have a phone call with the researcher and will have the opportunity to ask any questions about the study when deciding if they want to participate. Consent will be sought and then researcher will help the young person to set the app up, practice completing questions and answer any questions. Contact details for the participant and a trusted other will be sought at this stage. The participant will be asked to update the research team of any changes to this during their participation in the study. The young person will be reminded that if they are participating in follow up data collection, the research team will get in touch every six months to check on their treatment status, their contact details and whether they would like to continue with the study.

The young person will then complete a series of online cross sectional questionnaires related to mental health, mentalization and coping. To complete the ESM data collection, the young person will be asked to download an app on their mobile phone. The app will send notifications to prompt them to complete a brief questionnaire 10 times a day for seven consecutive days. On the app they will answer questions on positive and negative affect items, social context items and social context appraisals. The ESM app will also gather superficial data about factors related to mental health, specifically phone usage, social media usage activity levels and activity levels. This means that data can be gathered about social media app usage (e.g. which apps are open and for how long), activity levels (e.g. step count) and screen time (e.g. how long is phone unlocked for). This allows for a greater understanding of how the use of social media, mobile phones and activity levels change as lockdown restrictions
change and how this is associated with mental health. It is not possible for data about the content of apps to be collected. During the week of data collection, participants can get in touch with the researcher if any problems arise. At the end of the week, participants will be given a debrief sheet and can opt in to have a debrief call with the researcher to discuss their experiences, ask any questions they have and give feedback. This feedback will be used by the research team to develop and adapting the study. Data from this part of the study will be collected, analysed and the results will be written up in relation to the first study objective.

Adolescents who have consented to follow up will be contacted to every six months to check whether they are still being seen by CAMHS, whether they want to continue with the study and confirm contact details. At the end of their treatment in CAMHS, either the participant or the clinician will contact the research team to let them know that follow up data collection can begin. After two years the research team will contact the participant to ask if they would like to participate in the last set of data collection. During follow up, adolescents will complete the same set of questionnaires and ESM data collection. They will receive the same contact with the researchers. Data from the whole study will be collected and analysed and the results of this will be written up.

4 STUDY POPULATION

4.1 NUMBER OF PARTICIPANTS

Participants will be adolescents aged between 12-18 who are receiving treatment in CAMHS. Participants will be recruited from the outpatient CAMHS teams in NHS Lothian. Recruitment will commence once ethical approval from the NHS has been obtained. 60 participants will be recruited. At the start of the study they will complete questionnaires and then a week of ESM data collection. This will be repeated at the end of their treatment in CAMHS and again after two years if they have consented to participate in follow up.

4.2 INCLUSION CRITERIA

Participants will be included in the study if:

- They are receiving treatment in CAMHS
- They are aged between 12-18 years old.
- They are willing to take part and are able to understand the information sheet about the study

5 PARTICIPANT SELECTION AND ENROLMENT

5.1 IDENTIFYING PARTICIPANTS

Information about the study and recruitment will be provided to appropriate clinicians in CAMHS teams in the NHS Lothian Health Board. Potential participants will initially be approached by a clinician in their direct clinical care team if that clinician believes they might be eligible for the study and meets the inclusion criteria. Clinicians will be able to discuss the study in their routine sessions with potential participants and provide them with information sheets. If the young person identifies an interest in participating, they will have a call with the researcher to discuss this further and answer any questions.
5.2 CONSENTING PARTICIPANTS

Potential participants will be provided with developmentally appropriate information sheets. They will have time to read over this in between their routine sessions (typically 1-2 weeks) and have the opportunity to the researchers any questions that they have about the study. Participants aged between 12-15 will be asked to show their parents an information sheet and opt out form. Participants aged between 16-18 will be deemed able to consent to participating in the research as they will have consented to treatment in CAMHS.

Participants will be offered the opportunity to receive a £5 shopping voucher for participation in the study. Due to the burden and response rate required by participants, 53% of experience sampling methodology studies have reported employment of quasi-monetary incentive methods (Gabriel et al., 2019; whilst a third of studies identified by this review did not report which incentives were used). These studies have also rewarded participants on rate of completion, to increase responses and create fairness in rewards (Bono et al., 2013; Heller & Watson, 2005; Butts et al., 2015; Liu et al., 2017; Matta et al., 2017). The amount of monetary prizes and draws has varied between ESM studies. The voucher payment is consistent with the British Psychological Society Code of Human Research Ethics (Oates et al., 2021; Pg. 19-20), stating that payment should be offered to participants whereby they are giving a substantial amount of time. This payment is suggested to be small enough as to not compromise freely made decisions, be given across all participants, and as such is matched to the minimum wage for those under 18 years of age. Existing participants will be contacted via the contact details they provided (telephone or email) to inform them that they may be awarded the £5 voucher and will be asked if they would like to receive this. This choice will be recorded on the file which includes the pseudonymised participant ID numbers, and saved on an NHS Lothian server. E.g., next to the participant ‘JB003’, it will be recorded as ‘consented to receive voucher’ or ‘did not consent to receive voucher’. For new participants, there will be a section within the online survey, where participants can consent to receive the voucher or not. They will still be able to participate if they opt-out of this and will be informed of this. This will be recorded on the same file as their pseudonymised ID number, saved on an NHS Lothian server.

5.2.1 Withdrawal of Study Participants

Participants are free to withdraw from the study at any point or a participant can be withdrawn by the Investigator. If withdrawal occurs, the primary reason for withdrawal will be documented in the participant’s case report form, if possible. The participant will have the option of withdrawal from:

(i) all aspects of the trial

A participant who no longer wants to continue with the study can choose to do so at any time and they will not have to provide any reasons why they have made this decision. They will however be made aware that feedback is appreciated if the feel able to do so. If they wish to do so during the questionnaires or ESM data collection, they can simply stop where they are. They can let their clinician know that they have chosen to withdraw from the study in their next appointment and they can delete the app from their phone as soon as they wish.

6 STUDY ASSESSMENTS

6.1 STUDY ASSESSMENTS
<table>
<thead>
<tr>
<th>Assessment</th>
<th>Appointment 1</th>
<th>Appointment 2</th>
<th>Day 1</th>
<th>Day 2</th>
<th>Day 3</th>
<th>Day 4</th>
<th>Day 5</th>
<th>Day 6</th>
<th>Day 7</th>
<th>Appointment 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assessment of eligibility criteria</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Initial discussion with researcher</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Written informed consent</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>YP shown how to use ESM app</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>demographic data and questionnaires</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ESM data collection</td>
<td>X X X X X X X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Optional Debrief</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Participants will be invited to look through information sheets, complete consent forms and fill out questionnaires on Qualtrics. Participants will be assigned anonymous personal identifiers to guarantee confidentiality and prevent names being linked to individual data. Personal identifiers will be stored securely on an NHS server.

Daily life data will be collected with the ESM, using an ‘app’ called MPath. The responses given on the app will be stored securely by an external company (KU Leuven Research and Development based in Belgium)

Data gathered from the app will be anonymised, transferred and stored on DataStore (http://www.eeo.ed.ac.uk/it/DataStore.html), a storage space in the University of Edinburgh server. Only researchers who are associated with the study and who have received Mantra training will have access through DataSync (https://www.ed.ac.uk/information-services/computing/desktop-personal/datasync) a Dropbox like hosting service for data sharing with controlled access, approved by the University of Edinburgh.
Anonymised data will be stored for 5 years. With participants consent, anonymised data will be uploaded to Edinburgh Data Share for ongoing use by the wider research community.

7 DATA COLLECTION

In the first step of data collection, participants will be invited to fill out questionnaires on Qualtrics. In the next stage, daily life data will be collected on this app that will either be downloaded on the participants phone. The app will prompt participants no more than 10 times per day for seven consecutive days to complete a brief questionnaire. The questionnaires will take no between 60-90 seconds to complete and the content will consist of positive and negative affect items, their thoughts and feelings, current activities and event related context. These items are largely based on the questions from a study running in Belgium and Germany. These prompts can occur outwith class times at school to reduce disruption and distractibility. The sampling will take place between 7-10.30 pm, unless the participant reports different times for going to sleep and waking up. The ESM app will also gather superficial data about factors related to mental health, specifically phone usage, social media usage activity levels and activity levels. This means that data can be gathered about social media app usage (e.g. which apps are open and for how long), activity levels (e.g. step count) and screen time (e.g. how long is phone unlocked for). It is not possible for data about the content of apps to be collected. This allows for a greater understanding of how the use of social media, mobile phones and activity levels change as lockdown restrictions change and how this is associated with mental health. During the week of data collection, the young person can contact the research team if any issues arise. After the week of ESM data collection, the young person will receive a debrief sheet and can opt in to a debrief call. They can share their data with their clinician in CAMHS if they choose to and can delete the app from their phone.

If the young person has consented to participating in follow up data collection, the participant or the clinician will be asked to let the researchers know when their treatment has come to an end in CAMHS. Once this has occurred, they will be contacted and follow up data collection will begin. They will complete the same set of questionnaires and ESM data collection. This procedure will be repeated after two years.

7.1 Source Data Documentation

Mentalization: The Reflective Functioning Questionnaire (RFQ) (Fonagy et al., 2016)

The Reflective Functioning Questionnaire is a self-report measure. This questionnaire uses a 7 point Likert scale and answers range from strongly disagree to strongly agree. The RFQ includes two subscales on certainty and uncertainty about mental states. The certainty subscale allows for the measurement of hypermentalizing and asks participants to rate how much they disagree with statements such as “people’s thoughts are a mystery to me”. On the uncertainty subscale participants are asked to rate how much they agree with statements such as “sometimes I do things without really knowing why”. Higher scores on this scale are indicative of hypomentalizing. The RFQ has been found to have acceptable internal consistency (Clinical sample: uncertainty subscale α=.77 and certainty subscale α=.65; Non-Clinical sample: uncertainty subscale α=.77 and certainty subscale α=.67). It also demonstrated excellent test-retest reliability over a three week period (rs=0.84 for the uncertainty subscale, rs= 0.74 for the certainty subscale) (Fonagy et al., 2016)
Coping: The Cognitive Emotion Regulation Questionnaire (CERQ) (Garnefski & Jraajj, 2006)

The Cognitive Emotion Regulation Questionnaire is a self-administered questionnaire that will be used to identify the cognitive coping strategies someone utilises following an aversive or challenging event. This questionnaire consists of 9 subscales: Self-blame, Other-blame, Ruminating, Catastrophising, Putting into Perspective, Positive Refocusing, Positive Reappraisal, Acceptance and Planning. This questionnaire uses a 5 point Likert scale with answers ranging from almost never to almost always. A higher score is reflective of the more a coping is used. The short version demonstrates an acceptable level of reliability (Self-Blame $\alpha=.68$, Acceptance $\alpha=.73$, Ruminating $\alpha=.79$, Positive Refocusing $\alpha=.80$, Refocus on planning $\alpha=.79$, Positive reappraisal $\alpha=.81$, Putting into Perspective $\alpha=.79$, Catastrophising $\alpha=.81$ and Other-Blame $\alpha=.77$) (Garnefski & Jraajj, 2006).

Mental Health: Mood and Feeling Questionnaire (MFQ) (Angold et al., 1995)

The Mood and Feeling Questionnaire will be used to provide a measure of depression. This questionnaire has been found to be a reliable and valid measure in both clinical and non-clinical samples (Burelson Daviss et al., 2006). The short version of the MFQ has been selected to reduce participant burden. This takes approximately 3-5 minutes to complete and has been found to strongly correlate with the longer version of the questionnaire (Thabrew et al., 2018) This questionnaire has 13 items and participants respond with either ‘not true’= 0 points, ‘sometimes true’= 1 point or ‘true’= 2 points. Higher scores on this questionnaire indicate more severe depressive symptoms.

Mental Health: The Generalised Anxiety Disorder Assessment (GAD-7) (Spitzer et al., 2006)

The Generalised Anxiety Disorder Assessment-7 has been selected to provide a measure of generalised anxiety disorder. This questionnaire has 7 items which ask the participant to rate the severity of their symptoms over the past two weeks. Participants can respond with ‘not at all’= 0 points, ‘several days’= 1 point, ‘more than half the days’= 2 points and ‘nearly every day’ = 3 points. Scores of 5 suggest mild anxiety, scores of 10 suggest moderate and scores of 15 suggest severe anxiety. This questionnaire is self-administered and takes around 1-2 minutes to complete. This questionnaire has been found to have good internal consistency and test-retest reliability (Spitzer et al., 2006)

Attachment: Inventory of Parent and Peer Attachment- Revised (Gullone & Robinson, 2005)

The IPPA was developed in order to assess adolescents' perceptions of the positive and negative affective/cognitive dimension of relationships with parents and close friends -- particularly how well these figures serve as sources of psychological security. The theoretical framework is attachment
theory. Three broad dimensions are assessed: degree of mutual trust, quality of communication, and extent of anger and alienation. The instrument is a self-report questionnaire with a five-point Likert scale response format. The IPPA consists of 12 items for the mother, 12 items for the father, and 12 items for peers. This revised measure shows good reliability and validity (Gullone & Robinson, 2005).

**Attachment: Experiences in Close Relationships Scale – Revised Child version (Brenning et al., 2014)**

The Experience in Close Relationship Scale (ECRS) is a tool for measuring anxious and avoidant attachment to parents in middle childhood and adolescence. The ECR-RC showed excellent reliability and validity (Brenning et al., 2014)

**Experience Sampling Method**

Semi-random time contingent ESM will allow for assessing moment to moment variation in the real world and real time with high ecological validity. The specific ESM items will largely be based on the questions of a study already running in Belgium and will mirror the concepts in the baseline measures described above. The items will be designed to not be time consuming and questions will focus on the how the individual is responding in that moment, as opposed to focusing on their experiences in general. Visual analogue scales will be used as the measurement instrument. Previous research has demonstrated the feasibility, reliability and validity of the assessment method (Csikszentmihaly & Larson, 2014; Santangelo et al., 2013).

8 DATA MANAGEMENT

**8.1.1 Personal Data**

The following personal data will be collected as part of the research: demographic data on age, gender and socio-economic status. Participants will sign an online consent form.

**Data Information Flow**

Personal data will be collected throughout the study and will be destroyed within 12 months of completion of the study.

**8.1.2 Transfer of Data**

Data collected or generated by the study (including personal data) will not be transferred to any external individuals or organisations outside of the Sponsoring organisation(s).

**8.1.3 Data Controller**

A data controller is an organisation that determines the purposes for which, and the manner in which, any personal data are processed.
The University of Edinburgh and NHS Lothian are joint data controllers along with any other entities involved in delivering the study that may be a data controller in accordance with applicable laws (e.g. the site)

8.1.4 Data Breaches

Any data breaches will be reported to the University of Edinburgh and NHS Lothian Data Protection Officers who will onward report to the relevant authority according to the appropriate timelines if required.

9 STATISTICS AND DATA ANALYSIS

9.1 SAMPLE SIZE CALCULATION

The sample size for this study is 60. In ESM research, a high number of data points is achieved from each individual because participants respond multiple times a day over numerous days. As such, a small sample size of participants is sufficient in statistical analyses that model within person relationships. A sample size of 60 will initially be recruited for to account for the possibility of attrition over the course of the study.

9.2 PROPOSED ANALYSES

Prior to analysis the data will be cleaned and checked.

ESM data collection involves a large number of repeated measurements on multiple variables per participant, meaning that data includes multiple responses nested within an individual. ESM data have a complex structure and the assumptions of traditional statistical methods such as a repeated measures ANOVA are not met. Multilevel modelling is a more appropriate method of analysis for ESM data (Gabriel et al., 2019). As such, multilevel models will be used to analyse the ESM data gathered in this study.

10 RISKS

As the participants will be receiving support from CAMHS for their mental health, it is possible that over the course of the data collection period they may experience distress. They will be encouraged to follow the strategies they are learning in CAMHS if that is manageable, to contact their local CAMHS team’s duty service or to get in touch with emergency services if necessary. If the young person’s response on the experience sampling questions or questionnaires are relevant for risk related measures, the research team will make the young person’s key worker in CAMHS aware of this. Changes in distress linked to participation in the study will also be measured and if distress seems to be linked with involvement in the study, the researcher and young person will discuss any further engagement in the study.
11 OVERSIGHT ARRANGEMENTS

11.1 INSPECTION OF RECORDS

Investigators and institutions involved in the study will permit trial related monitoring and audits on behalf of the sponsor, REC review, and regulatory inspection(s). In the event of audit or monitoring, the Investigator agrees to allow the representatives of the sponsor direct access to all study records and source documentation. In the event of regulatory inspection, the Investigator agrees to allow inspectors direct access to all study records and source documentation.

11.2 STUDY MONITORING AND AUDIT

The ACCORD Sponsor Representative will assess the study to determine if an independent risk assessment is required. If required, the independent risk assessment will be carried out by the ACCORD Quality Assurance Group to determine if an audit should be performed before/during/after the study and, if so, at what frequency.

Risk assessment, if required, will determine if audit by the ACCORD QA group is required. Should audit be required, details will be captured in an audit plan. Audit of Investigator sites, study management activities and study collaborative units, facilities and 3rd parties may be performed.

12 GOOD CLINICAL PRACTICE

12.1 ETHICAL CONDUCT

The study will be conducted in accordance with the principles of the International Conference on Harmonisation Tripartite Guideline for Good Clinical Practice (ICH GCP).

Before the study can commence, all required approvals will be obtained and any conditions of approvals will be met.

12.2 INVESTIGATOR RESPONSIBILITIES

The Investigator is responsible for the overall conduct of the study at the site and compliance with the protocol and any protocol amendments. In accordance with the principles of ICH GCP, the following areas listed in this section are also the responsibility of the Investigator. Responsibilities may be delegated to an appropriate member of study site staff.

12.2.1 Informed Consent

The Investigator is responsible for ensuring informed consent is obtained before any protocol specific procedures are carried out. The decision of a participant to participate in clinical research is voluntary and should be based on a clear understanding of what is involved.

Participants must receive adequate oral and written information – appropriate Participant Information and Informed Consent Forms will be provided. The oral explanation to the participant will be performed by the Investigator or qualified delegated person, and must cover all the elements specified in the Participant Information Sheet and Consent Form.

The participant must be given every opportunity to clarify any points they do not understand and, if necessary, ask for more information. The participant must be given sufficient time to consider the information provided. It should be emphasised that the participant may withdraw their consent to participate at any time without loss of benefits to which they otherwise would be entitled.
The participant will be informed and agree to their medical records being inspected by regulatory authorities and representatives of the sponsor(s).

The Investigator or delegated member of the trial team and the participant will sign and date the Informed Consent Form(s) to confirm that consent has been obtained. The participant will receive a copy of this document and a copy filed in the Investigator Site File (ISF) and participant’s medical notes (if applicable).

12.2.2 Study Site Staff

The Investigator must be familiar with the protocol and the study requirements. It is the Investigator’s responsibility to ensure that all staff assisting with the study are adequately informed about the protocol and their trial related duties.

12.2.3 Data Recording

The Principal Investigator is responsible for the quality of the data recorded in the CRF at each Investigator Site.

12.2.4 Investigator Documentation

- The Principal Investigator will ensure that the required documentation is available in local Investigator Site files ISFs.

12.2.5 GCP Training

For non-CTIMP (i.e. non-drug) studies all researchers are encouraged to undertake GCP training in order to understand the principles of GCP. However, this is not a mandatory requirement unless deemed so by the sponsor. GCP training status for all investigators should be indicated in their respective CVs.

12.2.6 Confidentiality

All, evaluation forms, reports, and other records must be identified in a manner designed to maintain participant confidentiality. All records must be kept in a secure storage area with limited access. Clinical information will not be released without the written permission of the participant. The Investigator and study site staff involved with this study may not disclose or use for any purpose other than performance of the study, any data, record, or other unpublished information, which is confidential or identifiable, and has been disclosed to those individuals for the purpose of the study. Prior written agreement from the sponsor or its designee must be obtained for the disclosure of any said confidential information to other parties.

Personal identifiable information will be kept and stored securely and separately from research data. Personal identifiable information will be kept and stored securely on an NHS server. This will be stored separately from the anonymised research data. Only researchers directly involved with the study will have access to this information.

The app won’t store any personal identifiable information or information about our study. If a participant’s phone gets lost or stolen, they can get in touch with the research team who can ensure that any data on the app can be deleted remotely.

Confidentiality will only be breached if a participant is identified as being at risk of coming to harm themselves or harming others. In such an instance, the benefit of ensuring safety and wellbeing outweighs the risk of breaching confidentiality.
12.2.7 Data Protection

All Investigators and study site staff involved with this study must comply with the requirements of the appropriate data protection legislation (including the General Data Protection Regulation and Data Protection Act) with regard to the collection, storage, processing and disclosure of personal information.

Computers used to collate the data will have limited access measures via user names and passwords.

Published results will not contain any personal data and be of a form where individuals are not identified and re-identification is not likely to take place

STUDY CONDUCT RESPONSIBILITIES

12.3 PROTOCOL AMENDMENTS

Any changes in research activity, except those necessary to remove an apparent, immediate hazard to the participant in the case of an urgent safety measure, must be reviewed and approved by the Chief Investigator.

Amendments will be submitted to a sponsor representative for review and authorisation before being submitted in writing to the appropriate REC, and local R&D for approval prior to participants being enrolled into an amended protocol.

12.4 MANAGEMENT OF PROTOCOL NON COMPLIANCE

Prospective protocol deviations, i.e. protocol waivers, will not be approved by the sponsors and therefore will not be implemented, except where necessary to eliminate an immediate hazard to study participants. If this necessitates a subsequent protocol amendment, this should be submitted to the REC, and local R&D for review and approval if appropriate.

Protocol deviations will be recorded in a protocol deviation log and logs will be submitted to the sponsors every 3 months. Each protocol violation will be reported to the sponsor within 3 days of becoming aware of the violation. All protocol deviation logs and violation forms should be emailed to QA@accord.scot

Deviations and violations are non-compliance events discovered after the event has occurred. Deviation logs will be maintained for each site in multi-centre studies. An alternative frequency of deviation log submission to the sponsors may be agreed in writing with the sponsors.

12.5 SERIOUS BREACH REQUIREMENTS

A serious breach is a breach which is likely to effect to a significant degree:

(a) the safety or physical or mental integrity of the participants of the trial; or

(b) the scientific value of the trial.

If a potential serious breach is identified by the Chief investigator, Principal Investigator or delegates, the co-sponsors (seriousbreach@accord.scot) must be notified within 24 hours. It is the responsibility of the co-sponsors to assess the impact of the breach on the scientific value of the trial, to determine whether the incident constitutes a serious breach and report to research ethics committees as necessary.
12.6 STUDY RECORD RETENTION

All study documentation will be kept for a minimum of 5 years from the protocol defined end of study point. When the minimum retention period has elapsed, study documentation will not be destroyed without permission from the sponsor.

12.7 END OF STUDY

The end of study is defined as the last participant’s last visit.

The Investigators or the co-sponsor(s) have the right at any time to terminate the study for clinical or administrative reasons.

The end of the study will be reported to the REC, and R+D Office(s) and co-sponsors within 90 days, or 15 days if the study is terminated prematurely. The Investigators will inform participants of the premature study closure and ensure that the appropriate follow up is arranged for all participants involved. End of study notification will be reported to the co-sponsors via email to resgov@accord.scot

A summary report of the study will be provided to the REC within 1 year of the end of the study.

12.8 INSURANCE AND INDEMNITY

The co-sponsors are responsible for ensuring proper provision has been made for insurance or indemnity to cover their liability and the liability of the Chief Investigator and staff.

The following arrangements are in place to fulfil the co-sponsors’ responsibilities:

- The Protocol has been designed by the Chief Investigator and researchers employed by the University and collaborators. The University has insurance in place (which includes no-fault compensation) for negligent harm caused by poor protocol design by the Chief Investigator and researchers employed by the University.
- Sites participating in the study will be liable for clinical negligence and other negligent harm to individuals taking part in the study and covered by the duty of care owed to them by the sites concerned. The co-sponsors require individual sites participating in the study to arrange for their own insurance or indemnity in respect of these liabilities.
- Sites which are part of the United Kingdom’s National Health Service will have the benefit of NHS Indemnity.
- Sites out with the United Kingdom will be responsible for arranging their own indemnity or insurance for their participation in the study, as well as for compliance with local law applicable to their participation in the study.

13 REPORTING, PUBLICATIONS AND NOTIFICATION OF RESULTS

13.1 AUTHORSHIP POLICY

Ownership of the data arising from this study resides with the study team.

14 REFERENCES


Appendix I

Clinical Psychology Review, Elsevier, Submission Guidance for Authors (with Exclusion of Word Count)

Clinical Psychology Review, Elsevier, Submission Guidance for Authors (with Exclusion of Word Count)

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

Reviews on other topics, such as psychophysiology, learning therapy, experimental psychopathology, and social psychology often appear if they have a clear relationship to research or practice in clinical psychology. Integrative literature reviews and summary reports of innovative ongoing clinical research programs are also sometimes published. Reports on individual research studies and theoretical treatises or clinical guides without an empirical base are not appropriate.

Benefits to authors

We also provide many author benefits, such as free PDFs, a liberal copyright policy, special discounts on Elsevier publications and much more. Please click here for more information on our author services.
Please see our Guide for Authors for information on article submission. If you require any further information or help, please visit our Support Center.

AUDIENCE

Psychologists and Clinicians in Psychopathy

IMPACT FACTOR

2021: 11.397 © Clarivate Analytics Journal Citation Reports 2022

ABSTRACTING AND INDEXING

PsycINFO
Current Contents - Social & Behavioral Sciences
BIOSIS Citation Index
Embase
Scopus
Google Scholar
PubMed/Medline

EDITORIAL BOARD

Editor-in-Chief
Gordon Asmundson, University of Regina, Regina, Saskatchewan, Canada
Anxiety disorders, Fear, Stress, Psychology of pandemics, Chronic pain, Treatment innovation

Editors
Ernst Koster, Gent, Belgium
Experimental psychopatholog, Depression, Anxiety, Attentional bias, Cognitive bias modification, Emotion regulation
Christine Purdon, Waterloo, Ontario, Canada
OCD, Obsessions, Compulsions, Cognitive Behaviour Therapy, Anxiety, Anxiety Disorders
Annemieke van Straten, Amsterdam, Netherlands
Insomnia, Depression, Internet, Meta-analysis, CBTi, Stepped care, Care services
Michael J. Zvolensky, Houston, Texas, United States of America
Addiction, Anxiety, Stress, Comorbidity, Behavioral medicine, Fatigue, Chronic pain, Tobacco, Physical activity

**Editorial Board**

Ruth A. Baer, University of Kentucky, Lexington, Kentucky, United States of America

Daniel Bagner, Florida International University, Miami, Florida, United States of America

Anna M. Bardone-Cone, The University of North Carolina at Chapel Hill, Chapel Hill, North Carolina, United States of America

Linda Booij, Concordia University, Montréal, Quebec, Canada

Eating disorders, Brain development, Mental health, Depression, Early adversity, Gene-environment interaction

Andrew Busch, The Miriam Hospital, Centers for Behavioral and Preventive Medicine, Providence, Rhode Island, United States of America

Depression treatment, Smoking cessation, Health behavior change, Physical and Mental illness interactions

John Calamari, Rosalind Franklin University of Medicine and Science, Department of Psychology, North Chicago, Illinois, United States of America

Anxiety, Obsessive-Compulsive Disorders, Risk Factors, Hoarding Disorder

Michael Christopher, Pacific University, Forest Grove, Oregon, United States of America

Mindfulness, Resilience, Stress reactivity, Diversity

Pim Cuijpers, VU Amsterdam, Amsterdam, Netherlands

Prevention of mental disorders, psychological treatments of depression and anxiety disorders, and Internet-delivered treatments

Melissa Cyders, Indiana University Purdue University Indianapolis, Indianapolis, Indiana, United States of America

Joanne Davis, The University of Tulsa, Tulsa, Oklahoma, United States of America

Sleep disorders, Nightmares, Insomnia, Trauma, PTSD

Jon D. Elhai, The University of Toledo, Toledo, Ohio, United States of America Posttraumatic stress disorder

Brandon A. Gaudiano, Brown University, Providence, Rhode Island, United States of America

Bipolar disorder, Psychosis, Acceptance and commitment therapy, Mindfulness, Evidence-based practice

David A. F. Haaga, American University, Department of Psychology, Washington, United States of America

Cognitive therapy, Assessment, Smoking, Trichotillomania, Depression

Gretchen Haas, University of Pittsburgh, Pittsburgh, Pennsylvania, United States of America

Psychosis, Schizophrenia, Major Depression, Suicide, Social cognition

Gerald Haeffel, University of Notre Dame, Notre Dame, Indiana, United States of America

Depression, Cognition, Vulnerability, Stress, Reappraisal
Richard Hallam, London, United Kingdom
Case formulation, Concept of mental illness, Psychotherapy, Human evolution

Martin Harrow, University of Illinois Chicago College of Medicine, Chicago, Illinois, United States of America

Holly Hazlett-Stevens, University of Nevada Reno, Reno, Nevada, United States of America
Mindfulness, Mindfulness-based stress reduction, Anxiety, Worry

Eli Lebowitz, Yale School of Medicine, New Haven, Connecticut, United States of America
Childhood and adolescent anxiety and related disorders, Parent-based treatment

Ellen W. Leen-Feldner, University of Arkansas Bookstore, Fayetteville, Arkansas, United States of America
developmental psychopathology, adolescent anxiety, parenting, cannabidiol, anxiety

Carl Lejuez, The University of Kansas, Lawrence, Kansas, United States of America
Childhood and adolescent anxiety and related disorders, Parent-based treatment

Ellen W. Leen-Feldner, University of Arkansas Bookstore, Fayetteville, Arkansas, United States of America
developmental psychopathology, adolescent anxiety, parenting, cannabidiol, anxiety

Richard Moulding, Cairnmillar Institute, Camberwell, Australia
OCD, Anxiety, CBT, Treatment, Emotion Regulation

Kim Mueser, Boston University, Boston, Massachusetts, United States of America
Schizophrenia, Severe mental illness, Treatment, Psychiatric rehabilitation, Social skills training, Family psychoeducation, Cognitive remediation

Jeremy Pettit, Florida International University, Miami, Florida, United States of America
depression, anxiety, suicidal thoughts and behaviors, attention bias, cognitive behavior therapy, children, adolescents

Suzanne Pineles, VA Boston Health Care System Jamaica Plain Campus, Boston, Massachusetts, United States of America
PTSD, Sex differences, Psychophysiology, Fear conditioning and extinction

Karen Rowa, McMaster University and St. Joseph's Healthcare Hamilton, Anxiety Treatment and Research Clinic, Hamilton, Ontario, Canada
Cognitive Behavioural Therapy, Family Accommodation, Treatment Outcome, Hoarding Disorder

Kristalyn Salters-Pedneault, Eastern Connecticut State University, Willimantic, Connecticut, United States of America
Anxiety, Fear, Trauma, Mindfulness, Acceptance

Donald Sharpe, University of Regina, Regina, Saskatchewan, Canada Statistics, Methodology

Eric A. Storch, Baylor College of Medicine, Houston, Texas, United States of America Obsessive-compulsive disorder

Bruce Wampold, University of Wisconsin-Madison, Madison, Wisconsin, United States of America
Psychotherapy effectiveness, Relative efficacy, Meta-analyses, Common factors

Carl F. Weems, Iowa State University, Ames, Iowa, United States of America
Emotional Development, Traumatic and Adverse Childhood Experiences, Intervention, Prevention, Implementation
Submission checklist
You can use this list to carry out a final check of your submission before you send it to the journal for review. Please check the relevant section in this Guide for Authors for more details.

Ensure that the following items are present:

One author has been designated as the corresponding author with contact details:

- E-mail address
- Full postal address

All necessary files have been uploaded:

Manuscript:
- Include keywords
- All figures (include relevant captions)
- All tables (including titles, description, footnotes)
- Ensure all figure and table citations in the text match the files provided
- Indicate clearly if color should be used for any figures in print

Graphical Abstracts / Highlights files (where applicable)

Supplemental files (where applicable)

Critical Issues Ensure manuscript is a comprehensive review article (empirical papers fall outside the scope of the journal) Ensure that literature searches and reviews are as up to date as possible and at least to 3 months within date of submission Manuscript has been 'spell checked' and 'grammar checked' All references mentioned in the Reference List are cited in the text, and vice versa Permission has been obtained for use of copyrighted material from other sources (including the Internet) A competing interests statement is provided, even if the authors have no competing interests to declare • Journal policies detailed in this guide have been reviewed Referee suggestions and contact details provided, based on journal requirements Ensure manuscripts do not exceed 50 pages, including references and tabular material, unless you have obtained prior approval of the Editor in Chief for an exception Ensure Highlights do not exceed 3 to 5 bullet points with a maximum of 85 characters, including spaces, per bullet point Failure to follow these guidelines may result in your manuscript being returned for reformatting prior to further consideration by the journal.

For further information, visit our Support Center.
BEFORE YOU BEGIN

*Ethics in publishing*
Please see our information on Ethics in publishing.

**Declaration of interest**

All authors must disclose any financial and personal relationships with other people or organizations that could inappropriately influence (bias) their work. Examples of potential competing interests include employment, consultancies, stock ownership, honoraria, paid expert testimony, patent applications/registrations, and grants or other funding. Authors must disclose any interests in two places: 1. A summary declaration of interest statement in the title page file (if double anonymized) or the manuscript file (if single anonymized). If there are no interests to declare then please state this: 'Declarations of interest: none'. 2. Detailed disclosures as part of a separate Declaration of Interest form, which forms part of the journal’s official records. It is important for potential interests to be declared in both places and that the information matches. More information.

**Declaration of generative AI in scientific writing**

The below guidance only refers to the writing process, and not to the use of AI tools to analyse and draw insights from data as part of the research process.

Where authors use generative artificial intelligence (AI) and AI-assisted technologies in the writing process, authors should only use these technologies to improve readability and language. Applying the technology should be done with human oversight and control, and authors should carefully review and edit the result, as AI can generate authoritative-sounding output that can be incorrect, incomplete or biased. AI and AI-assisted technologies should not be listed as an author or co-author, or be cited as an author. Authorship implies responsibilities and tasks that can only be attributed to and performed by humans, as outlined in Elsevier’s AI policy for authors.

Authors should disclose in their manuscript the use of AI and AI-assisted technologies in the writing process by following the instructions below. A statement will appear in the published work. Please note that authors are ultimately responsible and accountable for the contents of the work.

**Disclosure instructions**

Authors must disclose the use of generative AI and AI-assisted technologies in the writing process by adding a statement at the end of their manuscript in the core manuscript file, before the References list. The statement should be placed in a new section entitled ‘Declaration of Generative AI and AI-assisted technologies in the writing process’.

*Statement: During the preparation of this work the author(s) used [NAME TOOL / SERVICE] in order to [REASON]. After using this tool/service, the author(s) reviewed and edited the content as needed and take(s) full responsibility for the content of the publication.*

This declaration does not apply to the use of basic tools for checking grammar, spelling, references etc. If there is nothing to disclose, there is no need to add a statement.

**Submission declaration and verification**
Submission of an article implies that the work described has not been published previously (except in the form of an abstract, a published lecture or academic thesis, see 'Multiple, redundant or concurrent publication' for more information), that it is not under consideration for publication elsewhere, that its publication is approved by all authors and tacitly or explicitly by the responsible authorities where the work was carried out, and that, if accepted, it will not be published elsewhere in the same form, in English or in any other language, including electronically without the written consent of the copyright holder. To verify compliance, your article may be checked by Crossref Similarity Check and other originality or duplicate checking software.

Preprints
Please note that preprints can be shared anywhere at any time, in line with Elsevier’s sharing policy. Sharing your preprints e.g. on a preprint server will not count as prior publication (see 'Multiple, redundant or concurrent publication' for more information).

Language (usage and editing services)
Please write your text in good English (American or British usage is accepted, but not a mixture of these). Authors who feel their English language manuscript may require editing to eliminate possible grammatical or spelling errors and to conform to correct scientific English may wish to use the English Language Editing service available from Elsevier’s Author Services.

Use of inclusive language
Inclusive language acknowledges diversity, conveys respect to all people, is sensitive to differences, and promotes equal opportunities. Content should make no assumptions about the beliefs or commitments of any reader; contain nothing which might imply that one individual is superior to another on the grounds of age, gender, race, ethnicity, culture, sexual orientation, disability or health condition; and use inclusive language throughout. Authors should ensure that writing is free from bias, stereotypes, slang, reference to dominant culture and/or cultural assumptions. We advise to seek gender neutrality by using plural nouns ("clinicians, patients/clients") as default/wherever possible to avoid using "he, she," or "he/she." We recommend avoiding the use of descriptors that refer to personal attributes such as age, gender, race, ethnicity, culture, sexual orientation, disability or health condition unless they are relevant and valid. When coding terminology is used, we recommend to avoid offensive or exclusionary terms such as "master", "slave", "blacklist" and "whitelist". We suggest using alternatives that are more appropriate and (self-) explanatory such as "primary", "secondary", "blocklist" and "allowlist". These guidelines are meant as a point of reference to help identify appropriate language but are by no means exhaustive or definitive.

Reporting sex- and gender-based analyses

Reporting guidance
For research involving or pertaining to humans, animals or eukaryotic cells, investigators should integrate sex and gender-based analyses (SGBA) into their research design according to funder/sponsor requirements and best practices within a field. Authors should address the sex and/or gender dimensions of their research in their article. In cases where they cannot, they should discuss this as a limitation to their research’s generalizability. Importantly, authors should explicitly state what definitions of sex and/or gender they are applying to enhance the precision, rigor and reproducibility of their research and to avoid ambiguity or conflation of terms and the constructs to which they refer (see Definitions section below). Authors can refer to the Sex and Gender Equity in Research (SAGER) guidelines and the SAGER guidelines checklist. These offer systematic approaches
to the use and editorial review of sex and gender information in study design, data analysis, outcome reporting and research interpretation - however, please note there is no single, universally agreed-upon set of guidelines for defining sex and gender.

Definitions

Sex generally refers to a set of biological attributes that are associated with physical and physiological features (e.g., chromosomal genotype, hormonal levels, internal and external anatomy). A binary sex categorization (male/female) is usually designated at birth ("sex assigned at birth"), most often based solely on the visible external anatomy of a newborn. Gender generally refers to socially constructed roles, behaviors, and identities of women, men and gender-diverse people that occur in a historical and cultural context and may vary across societies and over time. Gender influences how people view themselves and each other, how they behave and interact and how power is distributed in society. Sex and gender are often incorrectly portrayed as binary (female/male or woman/man) and unchanging whereas these constructs actually exist along a spectrum and include additional sex categorizations and gender identities such as people who are intersex/have differences of sex development (DSD) or identify as non-binary. Moreover, the terms "sex" and "gender" can be ambiguous—thus it is important for authors to define the manner in which they are used. In addition to this definition guidance and the SAGER guidelines, the resources on this page offer further insight around sex and gender in research studies.

Author contributions

For transparency, we encourage authors to submit an author statement file outlining their individual contributions to the paper using the relevant CRediT roles: Conceptualization; Data curation; Formal analysis; Funding acquisition; Investigation; Methodology; Project administration; Resources; Software; Supervision; Validation; Visualization; Roles/Writing - original draft; Writing - review & editing. Authorship statements should be formatted with the names of authors first and CRediT role(s) following. More details and an example.

Changes to authorship

Authors are expected to consider carefully the list and order of authors before submitting their manuscript and provide the definitive list of authors at the time of the original submission. Any addition, deletion or rearrangement of author names in the authorship list should be made only before the manuscript has been accepted and only if approved by the journal Editor. To request such a change, the Editor must receive the following from the corresponding author: (a) the reason for the change in author list and (b) written confirmation (e-mail, letter) from all authors that they agree with the addition, removal or rearrangement. In the case of addition or removal of authors, this includes confirmation from the author being added or removed.

Only in exceptional circumstances will the Editor consider the addition, deletion or rearrangement of authors after the manuscript has been accepted. While the Editor considers the request, publication of the manuscript will be suspended. If the manuscript has already been published in an online issue, any requests approved by the Editor will result in a corrigendum.

Article transfer service

This journal uses the Elsevier Article Transfer Service to find the best home for your manuscript. This means that if an editor feels your manuscript is more suitable for an alternative journal, you might be asked to consider transferring the manuscript to such a journal. The recommendation might be
provided by a Journal Editor, a dedicated Scientific Managing Editor, a tool assisted recommendation, or a combination. If you agree, your manuscript will be transferred, though you will have the opportunity to make changes to the manuscript before the submission is complete. Please note that your manuscript will be independently reviewed by the new journal. More information.

Author Disclosure Policy
Authors must provide three mandatory and one optional author disclosure statements. These statements should be submitted as one separate document and not included as part of the manuscript. Author disclosures will be automatically incorporated into the PDF builder of the online submission system. They will appear in the journal article if the manuscript is accepted.

The four statements of the author disclosure document are described below. Statements should not be numbered. Headings (i.e., Role of Funding Sources, Contributors, Conflict of Interest, Acknowledgements) should be in bold with no white space between the heading and the text. Font size should be the same as that used for references.

Statement 1: Role of Funding Sources
Authors must identify who provided financial support for the conduct of the research and/or preparation of the manuscript and to briefly describe the role (if any) of the funding sponsor in study design, collection, analysis, or interpretation of data, writing the manuscript, and the decision to submit the manuscript for publication. If the funding source had no such involvement, the authors should so state.

Example: Funding for this study was provided by NIAAA Grant R01-AA123456. NIAAA had no role in the study design, collection, analysis or interpretation of the data, writing the manuscript, or the decision to submit the paper for publication.

Statement 2: Contributors
Authors must declare their individual contributions to the manuscript. All authors must have materially participated in the research and/or the manuscript preparation. Roles for each author should be described. The disclosure must also clearly state and verify that all authors have approved the final manuscript.

Example: Authors A and B designed the study and wrote the protocol. Author C conducted literature searches and provided summaries of previous research studies. Author D conducted the statistical analysis. Author B wrote the first draft of the manuscript and all authors contributed to and have approved the final manuscript.

Statement 3: Conflict of Interest
All authors must disclose any actual or potential conflict of interest. Conflict of interest is defined as any financial or personal relationships with individuals or organizations, occurring within three (3) years of beginning the submitted work, which could inappropriately influence, or be perceived to have influenced the submitted research manuscript. Potential conflict of interest would include employment, consultancies, stock ownership (except personal investments equal to the lesser of one percent (1%) of total personal investments or USD$5000), honoraria, paid expert testimony, patent applications, registrations, and grants. If there are no conflicts of interest by any author, it should state that there are none.
Example: Author B is a paid consultant for XYZ pharmaceutical company. All other authors declare that they have no conflicts of interest.

**Statement 4: Acknowledgements (optional)**

Authors may provide Acknowledgments which will be published in a separate section along with the manuscript. If there are no Acknowledgements, there should be no heading or acknowledgement statement.

Example: The authors wish to thank Ms. A who assisted in the proof-reading of the manuscript.

**Copyright**

Upon acceptance of an article, authors will be asked to complete a 'Journal Publishing Agreement' (see [more information](#) on this). An e-mail will be sent to the corresponding author confirming receipt of the manuscript together with a 'Journal Publishing Agreement' form or a link to the online version of this agreement.

Subscribers may reproduce tables of contents or prepare lists of articles including abstracts for internal circulation within their institutions. Permission of the Publisher is required for resale or distribution outside the institution and for all other derivative works, including compilations and translations. If excerpts from other copyrighted works are included, the author(s) must obtain written permission from the copyright owners and credit the source(s) in the article. Elsevier has [preprinted forms](#) for use by authors in these cases.

For gold open access articles: Upon acceptance of an article, authors will be asked to complete a 'License Agreement' ([more information](#)). Permitted third party reuse of gold open access articles is determined by the author's choice of [user license](#).

**Author rights**

As an author you (or your employer or institution) have certain rights to reuse your work. [More information](#).

*Elsevier supports responsible sharing*  
Find out how you can [share your research](#) published in Elsevier journals.

**Role of the funding source**

You are requested to identify who provided financial support for the conduct of the research and/or preparation of the article and to briefly describe the role of the sponsor(s), if any, in study design; in the collection, analysis and interpretation of data; in the writing of the report; and in the decision to submit the article for publication. If the funding source(s) had no such involvement, it is recommended to state this.

**Open access**

Please visit our [Open Access page](#) for more information.

**Elsevier Researcher Academy**

[Researcher Academy](#) is a free e-learning platform designed to support early and mid-career researchers throughout their research journey. The "Learn" environment at Researcher Academy
offers several interactive modules, webinars, downloadable guides and resources to guide you through the process of writing for research and going through peer review. Feel free to use these free resources to improve your submission and navigate the publication process with ease.

**Submission**

Our online submission system guides you stepwise through the process of entering your article details and uploading your files. The system converts your article files to a single PDF file used in the peer-review process. Editable files (e.g., Word, LaTeX) are required to typeset your article for final publication. All correspondence, including notification of the Editor's decision and requests for revision, is sent by e-mail.

**PREPARATION**

**Queries**

For questions about the editorial process (including the status of manuscripts under review) or for technical support on submissions, please visit our Support Center.

**Peer review**

This journal operates a single anonymized review process. All contributions will be initially assessed by the editor for suitability for the journal. Papers deemed suitable are then typically sent to a minimum of two independent expert reviewers to assess the scientific quality of the paper. The Editor is responsible for the final decision regarding acceptance or rejection of articles. The Editor's decision is final. Editors are not involved in decisions about papers which they have written themselves or have been written by family members or colleagues or which relate to products or services in which the editor has an interest. Any such submission is subject to all of the journal's usual procedures, with peer review handled independently of the relevant editor and their research groups. More information on types of peer review.

**Use of word processing software**

It is important that the file be saved in the native format of the word processor used. The text should be in single-column format. Keep the layout of the text as simple as possible. Most formatting codes will be removed and replaced on processing the article. In particular, do not use the word processor's options to justify text or to hyphenate words. However, do use bold face, italics, subscripts, superscripts etc. When preparing tables, if you are using a table grid, use only one grid for each individual table and not a grid for each row. If no grid is used, use tabs, not spaces, to align columns. The electronic text should be prepared in a way very similar to that of conventional manuscripts (see also the Guide to Publishing with Elsevier). Note that source files of figures, tables and text graphics will be required whether or not you embed your figures in the text. See also the section on Electronic artwork.

To avoid unnecessary errors you are strongly advised to use the 'spell-check' and 'grammar-check' functions of your word processor.

**Article structure**
Manuscripts should be prepared according to the guidelines set forth in the most recent publication manual of the American Psychological Association. Of note, section headings should not be numbered.

Manuscripts should ordinarily not exceed 50 pages, including references and tabular material. Exceptions may be made with prior approval of the Editor in Chief. Manuscript length can often be managed through the judicious use of appendices. In general the References section should be limited to citations actually discussed in the text. References to articles solely included in meta-analyses should be included in an appendix, which will appear in the online version of the paper but not in the print copy. Similarly, extensive Tables describing study characteristics, containing material published elsewhere, or presenting formulas and other technical material should also be included in an appendix. Authors can direct readers to the appendices in appropriate places in the text.

It is authors’ responsibility to ensure their reviews are comprehensive and as up to date as possible (at least to 3 months within date of submission) so the data are still current at the time of publication. Authors are referred to the PRISMA Guidelines (http://www.prisma-statement.org/) for guidance in conducting reviews and preparing manuscripts. Adherence to the Guidelines is not required, but is recommended to enhance quality of submissions and impact of published papers on the field.

Appendices
If there is more than one appendix, they should be identified as A, B, etc. Formulae and equations in appendices should be given separate numbering: Eq. (A.1), Eq. (A.2), etc.; in a subsequent appendix, Eq. (B.1) and so on. Similarly for tables and figures: Table A.1; Fig. A.1, etc.

Essential title page information

Title. Concise and informative. Titles are often used in information-retrieval systems. Avoid abbreviations and formulae where possible. Note: The title page should be the first page of the manuscript document indicating the author’s names and affiliations and the corresponding author’s complete contact information.

Author names and affiliations. Where the family name may be ambiguous (e.g., a double name), please indicate this clearly. Present the authors’ affiliation addresses (where the actual work was done) below the names. Indicate all affiliations with a lower-case superscript letter immediately after the author’s name and in front of the appropriate address. Provide the full postal address of each affiliation, including the country name, and, if available, the e-mail address of each author within the cover letter.

Corresponding author. Clearly indicate who is willing to handle correspondence at all stages of refereeing and publication, also post-publication. Ensure that telephone and fax numbers (with country and area code) are provided in addition to the e-mail address and the complete postal address.

Present/permanent address. If an author has moved since the work described in the article was done, or was visiting at the time, a "Present address" (or "Permanent address") may be indicated as a footnote to that author's name. The address at which the author actually did the work
must be retained as the main, affiliation address. Superscript Arabic numerals are used for such footnotes.

**Highlights**

Highlights are mandatory for this journal as they help increase the discoverability of your article via search engines. They consist of a short collection of bullet points that capture the novel results of your research as well as new methods that were used during the study (if any). Please have a look at the examples here: example Highlights.

Highlights should be submitted in a separate editable file in the online submission system. Please use 'Highlights' in the file name and include 3 to 5 bullet points (maximum 85 characters, including spaces, per bullet point).

**Abstract**

A concise and factual abstract is required (not exceeding 200 words). This should be typed on a separate page following the title page. The abstract should state briefly the purpose of the research, the principal results and major conclusions. An abstract is often presented separate from the article, so it must be able to stand alone. References should therefore be avoided, but if essential, they must be cited in full, without reference to the reference list.

**Graphical abstract**

Although a graphical abstract is optional, its use is encouraged as it draws more attention to the online article. The graphical abstract should summarize the contents of the article in a concise, pictorial form designed to capture the attention of a wide readership. Graphical abstracts should be submitted as a separate file in the online submission system. Image size: Please provide an image with a minimum of 531 × 1328 pixels (h × w) or proportionally more. The image should be readable at a size of 5 × 13 cm using a regular screen resolution of 96 dpi. Preferred file types: TIFF, EPS, PDF or MS Office files. You can view Example Graphical Abstracts on our information site.

**Keywords**

Immediately after the abstract, provide a maximum of 6 keywords, using American spelling and avoiding general and plural terms and multiple concepts (avoid, for example, 'and', 'of'). Be sparing with abbreviations: only abbreviations firmly established in the field may be eligible. These keywords will be used for indexing purposes.

**Abbreviations**

Define abbreviations that are not standard in this field in a footnote to be placed on the first page of the article. Such abbreviations that are unavoidable in the abstract must be defined at their first mention there, as well as in the footnote. Ensure consistency of abbreviations throughout the article.

**Acknowledgements**

Collate acknowledgements in a separate section at the end of the article before the references and do not, therefore, include them on the title page, as a footnote to the title or otherwise. List here those individuals who provided help during the research (e.g., providing language help, writing assistance or proof reading the article, etc.).
Formatting of funding sources

List funding sources in this standard way to facilitate compliance to funder's requirements:

Funding: This work was supported by the National Institutes of Health [grant numbers xxxx, yyyy]; the Bill & Melinda Gates Foundation, Seattle, WA [grant number zzzz]; and the United States Institutes of Peace [grant number aaaa].

It is not necessary to include detailed descriptions on the program or type of grants and awards. When funding is from a block grant or other resources available to a university, college, or other research institution, submit the name of the institute or organization that provided the funding.

If no funding has been provided for the research, it is recommended to include the following sentence:

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Footnotes

Footnotes should be used sparingly. Number them consecutively throughout the article. Many word processors can build footnotes into the text, and this feature may be used. Otherwise, please indicate the position of footnotes in the text and list the footnotes themselves separately at the end of the article. Do not include footnotes in the Reference list.

Electronic artwork General points

- Make sure you use uniform lettering and sizing of your original artwork.
- Embed the used fonts if the application provides that option.
- Aim to use the following fonts in your illustrations: Arial, Courier, Times New Roman, Symbol, or use fonts that look similar.
- Number the illustrations according to their sequence in the text.
- Use a logical naming convention for your artwork files.
- Provide captions to illustrations separately.
- Size the illustrations close to the desired dimensions of the published version.
- Submit each illustration as a separate file.
- Ensure that color images are accessible to all, including those with impaired color vision.

A detailed guide on electronic artwork is available.

You are urged to visit this site; some excerpts from the detailed information are given here. Formats

If your electronic artwork is created in a Microsoft Office application (Word, PowerPoint, Excel) then please supply 'as is' in the native document format.

Regardless of the application used other than Microsoft Office, when your electronic artwork is finalized, please 'Save as' or convert the images to one of the following formats (note the resolution requirements for line drawings, halftones, and line/halftone combinations given below):

EPS (or PDF): Vector drawings, embed all used fonts.

TIFF (or JPEG): Color or grayscale photographs (halftones), keep to a minimum of 300 dpi.

TIFF (or JPEG): Bitmapped (pure black & white pixels) line drawings, keep to a minimum of 1000 dpi.

TIFF (or JPEG): Combinations bitmapped line/half-tone (color or grayscale), keep to a minimum of 500 dpi.
Please do not:

• Supply files that are optimized for screen use (e.g., GIF, BMP, PICT, WPG); these typically have a low number of pixels and limited set of colors;
• Supply files that are too low in resolution;
• Submit graphics that are disproportionately large for the content.

Color artwork
Please make sure that artwork files are in an acceptable format (TIFF (or JPEG), EPS (or PDF), or MS Office files) and with the correct resolution. If, together with your accepted article, you submit usable color figures then Elsevier will ensure, at no additional charge, that these figures will appear in color online (e.g., ScienceDirect and other sites) regardless of whether or not these illustrations are reproduced in color in the printed version. For color reproduction in print, you will receive information regarding the costs from Elsevier after receipt of your accepted article. Please indicate your preference for color: in print or online only. Further information on the preparation of electronic artwork.

Figure captions
Ensure that each illustration has a caption. Supply captions separately, not attached to the figure. A caption should comprise a brief title (not on the figure itself) and a description of the illustration. Keep text in the illustrations themselves to a minimum but explain all symbols and abbreviations used.

Tables
Please submit tables as editable text and not as images. Tables can be placed either next to the relevant text in the article, or on separate page(s) at the end. Number tables consecutively in accordance with their appearance in the text and place any table notes below the table body. Be sparing in the use of tables and ensure that the data presented in them do not duplicate results described elsewhere in the article. Please avoid using vertical rules and shading in table cells.

References
Citations in the text should follow the referencing style used by the American Psychological Association. You are referred to the most recent publication manual of the American Psychological Association. Information can be found at https://apastyle.apa.org/

Citation in text
Please ensure that every reference cited in the text is also present in the reference list (and vice versa). Any references cited in the abstract must be given in full. Unpublished results and personal communications are not recommended in the reference list, but may be mentioned in the text. If these references are included in the reference list they should follow the standard reference style of the journal and should include a substitution of the publication date with either ‘Unpublished results’ or ‘Personal communication’. Citation of a reference as ‘in press’ implies that the item has been accepted for publication.

Web references
As a minimum, the full URL should be given and the date when the reference was last accessed. Any further information, if known (DOI, author names, dates, reference to a source publication, etc.), should also be given. Web references can be listed separately (e.g., after the reference list) under a different heading if desired, or can be included in the reference list.
Data references

This journal encourages you to cite underlying or relevant datasets in your manuscript by citing them in your text and including a data reference in your Reference List. Data references should include the following elements: author name(s), dataset title, data repository, version (where available), year, and global persistent identifier. Add [dataset] immediately before the reference so we can properly identify it as a data reference. The [dataset] identifier will not appear in your published article.

Preprint references

Where a preprint has subsequently become available as a peer-reviewed publication, the formal publication should be used as the reference. If there are preprints that are central to your work or that cover crucial developments in the topic, but are not yet formally published, these may be referenced. Preprints should be clearly marked as such, for example by including the word preprint, or the name of the preprint server, as part of the reference. The preprint DOI should also be provided.

References in a special issue

Please ensure that the words 'this issue' are added to any references in the list (and any citations in the text) to other articles in the same Special Issue.

Reference management software

Most Elsevier journals have their reference template available in many of the most popular reference management software products. These include all products that support Citation Style Language styles, such as Mendeley. Using citation plug-ins from these products, authors only need to select the appropriate journal template when preparing their article, after which citations and bibliographies will be automatically formatted in the journal's style. If no template is yet available for this journal, please follow the format of the sample references and citations as shown in this Guide. If you use reference management software, please ensure that you remove all field codes before submitting the electronic manuscript. More information on how to remove field codes from different reference management software.

References should be arranged first alphabetically and then further sorted chronologically if necessary. More than one reference from the same author(s) in the same year must be identified by the letters "a", "b", "c", etc., placed after the year of publication. References should be formatted with a hanging indent (i.e., the first line of each reference is flush left while the subsequent lines are indented).

Examples:


Video

Elsevier accepts video material and animation sequences to support and enhance your scientific research. Authors who have video or animation files that they wish to submit with their article are strongly encouraged to include links to these within the body of the article. This can be done in the same way as a figure or table by referring to the video or animation content and noting in the body text where it should be placed. All submitted files should be properly labeled so that they directly relate to the video file's content. In order to ensure that your video or animation material is directly usable, please provide the file in one of our recommended file formats with a preferred maximum size of 150 MB per file, 1 GB in total. Video and animation files supplied will be published online in the electronic version of your article in Elsevier Web products, including ScienceDirect. Please supply 'stills' with your files: you can choose any frame from the video or animation or make a separate image. These will be used instead of standard icons and will personalize the link to your video data. For more detailed instructions please visit our video instruction pages. Note: since video and animation cannot be embedded in the print version of the journal, please provide text for both the electronic and the print version for the portions of the article that refer to this content.

Supplementary material

Supplementary material such as applications, images and sound clips, can be published with your article to enhance it. Submitted supplementary items are published exactly as they are received (Excel or PowerPoint files will appear as such online). Please submit your material together with the article and supply a concise, descriptive caption for each supplementary file. If you wish to make changes to supplementary material during any stage of the process, please make sure to provide an updated file. Do not annotate any corrections on a previous version. Please switch off the 'Track Changes' option in Microsoft Office files as these will appear in the published version.

Research data

This journal encourages and enables you to share data that supports your research publication where appropriate, and enables you to interlink the data with your published articles. Research data refers to the results of observations or experimentation that validate research findings. To facilitate reproducibility and data reuse, this journal also encourages you to share your software, code, models, algorithms, protocols, methods and other useful materials related to the project.

Below are a number of ways in which you can associate data with your article or make a statement about the availability of your data when submitting your manuscript. If you are sharing data in one of these ways, you are encouraged to cite the data in your manuscript and reference list. Please refer to the "References" section for more information about data citation. For more information on depositing, sharing and using research data and other relevant research materials, visit the research data page.

Data linking

If you have made your research data available in a data repository, you can link your article directly to the dataset. Elsevier collaborates with a number of repositories to link articles on ScienceDirect with relevant repositories, giving readers access to underlying data that gives them a better understanding of the research described.
There are different ways to link your datasets to your article. When available, you can directly link your dataset to your article by providing the relevant information in the submission system. For more information, visit the database linking page.

For supported data repositories a repository banner will automatically appear next to your published article on ScienceDirect.

In addition, you can link to relevant data or entities through identifiers within the text of your manuscript, using the following format: Database: xxxx (e.g., TAIR: AT1G01020; CCDC: 734053; PDB: 1XFN).

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

AFTER ACCEPTANCE

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

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

We will do everything possible to get your article published quickly and accurately. Please use this proof only for checking the typesetting, editing, completeness and correctness of the text, tables and figures. Significant changes to the article as accepted for publication will only be considered at this stage with permission from the Editor. It is important to ensure that all corrections are sent back to us in one communication. Please check carefully before replying, as inclusion of any subsequent corrections cannot be guaranteed. Proofreading is solely your responsibility.

Offprints
The corresponding author will, at no cost, receive a customized Share Link providing 50 days free access to the final published version of the article on ScienceDirect. The Share Link can be used for sharing the article via any communication channel, including email and social media. For an extra charge, paper offprints can be ordered via the offprint order form which is sent once the article is accepted for publication. Corresponding authors who have published their article gold open access do not receive a Share Link as their final published version of the article is available open access on ScienceDirect and can be shared through the article DOI link.
AUTHOR INQUIRIES

Visit the Elsevier Support Center to find the answers you need. Here you will find everything from Frequently Asked Questions to ways to get in touch.

You can also check the status of your submitted article or find out when your accepted article will be published.