# UNIVERSITY OF SOUTHAMPTON

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**Homelessness: Associations between Childhood Adversity, Attachment, Impulsivity and Maladaptive Behaviours.**

By

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Thesis for the degree of Doctor of Clinical Psychology

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# ABSTRACT

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## HOMELESSNESS: ASSOCIATIONS BETWEEN CHILDHOOD ADVERSITY, ATTACHMENT, IMPULSIVITY AND MALADAPTIVE BEHAVIOURS

Stephanie A. Smith

There are two sections to this thesis submission. The first is a systematic review exploring attachment styles within the homeless population and the role these play in the development of a variety of maladaptive behaviours. Following an extensive search of the literature, a total of 10 papers met inclusion criteria and underwent quality assessment and review. Whilst measures used to assess attachment and maladaptive behaviour varied greatly, high rates of insecure attachment and maladaptive behaviours were found within this population. Furthermore, the results suggest a significant relationship between insecure attachment and maladaptive behaviours, namely substance abuse, aggression and suicidal ideation. However, given the current paucity of papers within this field, the need for future research is discussed.

The second section sought to further investigate the prevalence of insecure attachment within the homeless population and explore its relationship with factors implicated in the development of homelessness, namely childhood adversity and impulsivity. Using a cross-sectional design, eighty-three homeless adults were recruited and completed self-report measures of childhood adversity, attachment and impulsivity. As anticipated, predicted associations were found between childhood adversity and insecure attachment, namely insecure-anxious and disorganised. However, such associations were not found for insecure-avoidant attachment. Furthermore, whilst an association was found between insecure-avoidant attachment and impulsivity, no significant associations were found between impulsivity and childhood adversity nor either of the other insecure attachment styles. Clinical implications and suggestions for future research are discussed in light of these findings

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# Declaration of Authorship

I, Stephanie Smith, declare that this thesis and the work presented in it are my own and has been generated by me as the result of my own original research.

**Homelessness: Associations between Childhood Adversity, Attachment, Impulsivity and Maladaptive Behaviours.**

I confirm that:

1. This work was done wholly or mainly while in candidature for a research degree at this University;
2. Where any part of this thesis has previously been submitted for a degree or any other qualification at this University or any other institution, this has been clearly stated;
3. Where I have consulted the published work of others, this is always clearly attributed;
4. Where I have quoted from the work of others, the source is always given. With the exception of such quotations, this thesis is entirely my own work;
5. I have acknowledged all main sources of help;
6. Where the thesis is based on work done by myself jointly with others, I have made clear exactly what was done by others and what I have contributed myself;
7. None of this work has been published before submission

Signed: .....

Date: .....

# Acknowledgements

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# Chapter 1 Literature Review

## 1.1 Introduction

### 1.1.1 Homelessness

Homelessness, commonly defined as “having no home or permanent place of residence” (Merriam-Webster, 2009), is an ever increasing societal concern. Recent figures estimate that 78,930 households are in temporary accommodation (Homeless Link, 2017) and 4,751 people were sleeping rough in England on any given night in Autumn 2017, a figure up 15% since 2016 (Ministry of Housing, Communities & Local Government, MHCLG, 2018).

Furthermore, homelessness is known to lead to dire ramifications on both a personal and financial level. Financially, the cost of homelessness in England is estimated at £1 billion a year, with a single person sleeping rough for 12 months costing the tax payer on average £20,128 (Pleace, 2015). There is also a damning human cost, with a number of grave consequences being linked to this population, including increased mortality, suicide and substance abuse issues (Warnes, Crane, Whitehead, & Fu, 2003).

Studies have also reported a higher prevalence of severe mental health problems in the homeless compared to the general population (Homeless Link, 2014, Folsom et al., 2005), with homelessness consistently being linked to major depression (Bifulco, Moran, Baines, Bunn, & Standford, 2002), personality disorders (Bierer et al., 2003), psychosis (Burns, Robins, Hodge, & Holmes, 2009), post-traumatic stress disorder (PTSD; Powers, Fani, Cross, Ressler & Bradley, 2016) and

attention deficit hyperactivity disorder (ADHD; Murillo, Ramos-Olazagasti, Mannuzza, Castellanos & Klein, 2016). As a result, understanding the factors implicated in the development and maintenance of homelessness is vitally important.

Whilst the pathways into homelessness are seen as highly heterogeneous, (Powell & Maguire, 2017; Victor, 1997) an interplay between common factors on a macro (i.e. lack of employment, poverty, and lack of suitable housing) and micro level (i.e. childhood adversity, mental health issues, leaving institutional settings) are recognised in the development and maintenance of homelessness (Morrell-Bellai, Goering, & Boydell, 2000). On a micro level, the use of maladaptive behaviours are consistently linked with increasing the risk of becoming homeless as well as acting as a barrier to exiting homelessness, e.g. repeated tenancy breakdown and difficulties engaging with support (Patterson, Currie, Rezansoff, & Somers, 2015; Maguire, Johnson, Vostanis, Keats, & Remington, 2009; Milburn et al., 2009).

### 1.1.2 Homelessness and Maladaptive Behaviours

Maladaptive behaviours, described in the literature as risky, self-defeating behavioural patterns which interfere with functioning and have the potential to damage the self and others (Kingston, 2009; Cooper, Wood, Orcutt, & Albino, 2003) are widely recognised in the homeless population (Powell & Maguire, 2017). Whilst this term is used to capture a vast array of problematic behaviours within clinical populations, drug and alcohol abuse, deliberate self harm (DSH), suicidal behaviours, high-risk sexual practices, and aggression are seen as particularly pertinent in homeless research (Powell & Maguire, 2017; Goldstein, Luther, & Haas, 2012).

For example, in a large systematic review examining the prevalence of mental illness in homeless people, high levels of alcohol and drug dependency were found (37.9% and 24.4% respectively; Fazel, Khosl, Doll, & Geddes, 2008). Furthermore, 60% of homeless individuals report suicidal ideation, 34% report attempting suicide (Eynan et al., 2002) and up to 31% of homeless people have engaged in some form of self harm (Herrman et al., 2004).

Although it is generally agreed that homeless individuals engage in maladaptive behaviours in order to cope with their chaotic lifestyles, past experiences and associated mental health difficulties (Bassuk, Buckner, Perloff, & Bassuk, 1998; Gratz, 2006), the exact process leading people to engage in such behaviours remains unclear (Powell & Maguire, 2017). Potential disturbances in affect regulation, i.e. difficulties in regulating emotions/coping with distress and the role of early parent-child attachment, in the development of these deficits have both been suggested (Priddis & Wallace, 2011; Golder, Gillmore, Spieker, & Morrison, 2005).

### 1.1.3 Attachment Theory

Attachment theory posits that early interactions with a primary caregiver are central in shaping a child's 'internal working model' (IWM), specifically their expectations and beliefs about themselves, their relationships and the outside world (Bowlby, 1977). This theory emphasises the importance of the quality of these early interactions in determining an individual's attachment style: a strategy an individual uses to relate to others, interpret others' actions and form bonds (Ainsworth, Blehar, Waters & Wall, 1978; Rutter, Kreppner, & Sonuga-Barke, 2009; Taylor-Seehafer,

Jacobvitz, & Steiker, 2008). Furthermore, it suggests that these attachment styles remain relatively stable across the life span, with these early IWM's forming a prototype to be used within adult relationships (Musetti, Terrone, Corsano, Magnani, & Salvatore, 2016; Fraley, 2002).

In terms of attachment styles, it is theorised that individuals who have experienced responsive, reliable and supportive primary care-giving which is attuned to their feelings will form a secure attachment, and as result will develop a positive IWM of themselves, worthy of feeling loved and confident to explore the world (Ainsworth et al., 1978). Conversely, individuals who have experienced inconsistent and/or unresponsive primary care-giving in times of need will form a type of insecure attachment, leading to a negative IWM of themselves and others, and a view of the world as an unpredictable and dangerous place (Bowlby, 1977); the type of insecure attachment namely 'insecure anxious/ambivalent' or 'insecure avoidant', typified by the specific symptoms and patterns of behaviour exhibited by the child when the attachment system is activated (Ainsworth et al., 1978).

More specifically, it is proposed that inconsistent caregiving will likely lead to the development of an insecure anxious attachment style, typified by fears of abandonment and separation (Ainsworth et al., 1978). Whereas, neglectful/ unresponsive caregiving will likely lead to an insecure-avoidant attachment style, typified by discomfort with intimacy and dependency (Ainsworth et al., 1978). 'Disorganised', a further insecure attachment style resulting from abusive, frightening care-giving and typified by a lack of coherent attachment strategy has now also been widely accepted (Main & Solomon, 1986).

In support of Bowlby's (1969) conceptualisation, Ainsworth et al., (1978) further investigated the nature of attachment behaviours and styles of attachment using the strange situation paradigm. Through their observational work they identified further subdivisions of insecure attachment, namely, 'insecure anxious/ambivalent' and 'insecure avoidant', typified by the specific symptoms and patterns of behaviour exhibited by the infant when their attachment system was activated (Ainsworth et al., 1978).

More specifically, individuals with anxious/ambivalent attachment styles were associated with caregivers who responded unpredictably, i.e. with a mixture of acceptance and rejection, to the child's distress, and as a result were unable to be contained by the care-giver's response. Whereas, individuals with insecure avoidant attachment styles were associated with caregivers who consistently failed to respond to the needs of the child and subsequently resulted in the child being reluctant to seek comfort from them. 'Disorganised', a further insecure attachment style resulting from abusive, frightening care-giving and typified by a lack of coherent attachment strategy was also later proposed and is now widely accepted as a fourth attachment category (Main & Solomon, 1986).

Since the work of Bowlby (1969) and Ainsworth et al. (1978), attachment theory has generated a large body of research. For example, consistent with the original theory, a meta-analysis by Van Ijzendoorn (1995) found differences in infant attachment styles directly linked to differences in care-giver warmth and support. Furthermore, numerous replications of the strange situation paradigm have been conducted and whilst differences in the distribution of attachment classifications

have been found both intra-culturally and cross-culturally (Van Ijzendoorn & Sagi, 1999; Posada et al., 1999), the four basic patterns of attachment have been found in all cultures studied (Van Ijzendoorn & Kroonenberg, 1988).

However, attachment theory hasn't been without criticism. Some critics suggest this theory doesn't fully take into account the intricacies of the family environment nor the impact of additional external (e.g. social) and internal (i.e. genetic) factors on an individual's future development (Harris, 1998; Pinker, 2002). In addition, whilst attachment theory stresses both the influence of early experiences on later relationships and the persistence of attachment patterns (Widom et al., 2018; Musetti, Terrone, Corsano, Magnani, & Salvatore, 2016; Fraley, 2002), others question the stability of these styles over the life-span. For example, studies have demonstrated changes in an individual's attachment style following specific relationship related life events (e.g. divorce; Scharfe & Bartholomew, 1994) and alterations in an individual's perception of self and others (e.g. changes in global self-esteem; Cozzarelli, Karafa, Colllins & Tagler, 2003).

However, research in this area is limited and relies heavily on retrospective data (Saunders et al., 2011). Furthermore, a wealth of longitudinal research has been conducted showing significant consistency in attachment classifications over time (Grossman, Grossman, & Waters, 2005) and as a result a number of empirically supported measures have been created to identify these attachment styles within adult populations. For some these directly map onto the distinct constructs outlined by Ainsworth et al. (1978), e.g. the Adult Attachment Interview (AAI; Main, Kaplan, & Cassidy, 1985) and the Relationship Questionnaire (RQ; Bartholomew &

Horowitz, 1991). See Table 1 for widely used infant and adult attachment classifications. Whereas others propose a two dimensional approach in defining attachment, e.g. anxious and avoidant scales (e.g. Experiences in Close Relationships – Revised, ECR; Fraley, Waller, & Brennan, 2000).

Table 1.*Classifications of Infant and Adult Attachment*

| **Infant Attachment** | **Adult Attachment** | | |
|---|---|---|---|
| Ainsworth et al., (1978) Main & Solomon, (1986) | Main et al., (1985) | Hazan & Shaver (1987) | Bartholomew & Horowitz (1991) |
| Secure | Secure-Autonomous | Secure | Secure |
| Anxious-Resistant | Pre-occupied-Entangled | Anxious-Ambivalent | Pre-occupied |
| Avoidant | Dismissing | Avoidant | Dismissing |
| (Disorganised – Disorientated) | Unresolved – Disorganised | | Fearful - Avoidant |

### 1.1.4 Attachment, Emotion Regulation and Maladaptive Behaviours

Beyond the capacity to form and maintain close relationships, it is proposed that parent-child attachments also serve as the basis for a number of fundamental developmental processes including emotion regulation, i.e. one's ability to tolerate negative feelings and modulate distress (Padykula & Conklin, 2010). According to attachment theory, the parent-child relationship provides an infant with the essential base from which to observe, model and develop regulation strategies (Powell & Maguire, 2017); a gradual process whereby an infant's affect regulation shifts from

being solely the care-givers responsibility to that of the infant's (Priddis & Wallace, 2011; Bowlby, 1998). It is suggested that when a caregiver is consistently calm and comforting the infant learns that their distress is not overwhelming and can be managed (Priddis & Wallace, 2011). Whereas when a care-giver is inconsistent or provides no comfort, the infant is required to develop their own skills to manage distress such as avoidance, hypervigilance and dissociation (Priddis & Wallace, 2011).

Subsequently, securely attached individuals are understood to be more open to emotional experiences, able to accept both positive and negative emotions and willing and able to engage in productive emotion regulation (Caspers, Yucuis, Troutman, & Spinks, 2006; Cassidy, 1994). Whereas insecurely attached individuals lack the internal mechanisms for managing these emotions or the ability to seek support and consequently may resort to maladaptive behaviours in order to regulate their distress (Schindler, Thomasius, Sack, Gemeinhardt, & Kustner, 2007).

In line with this and unsurprisingly, insecure attachment has been recognised as a vulnerability factor for a number of severe mental health problems including depression (e.g., Cantazaro & Wei, 2010), eating disorders (e.g., Illing, Tasca, Balfour, & Bissada. 2010), clinically significant anxiety (e.g., Bosmans, Braet, & Van Vlierberghe, 2010), and PTSD (e.g. Ein-Dor, Doron, Solomon, Mikulincer, & Shaver, 2010). It is also recognised as a key feature in many personality disorders (e.g., Crawford, Livesley & Jang, 2007)

Furthermore, high levels of insecure attachment have been identified in homeless individuals, a population known to engage in high levels of maladaptive behaviours (Dowling, 2014; Aliverdinia & Pridemore, 2012).

### 1.1.5 Aim and Scope of the Literature Review

Whilst theoretically the relationship between attachment and maladaptive behaviours is well documented and provides some clarity into the causes and maintenance factors associated with homelessness, this continues to be an emerging research area. Furthermore, despite similar reviews being conducted in other 'socially excluded' populations, e.g. offending populations (Bailey & Shelton, 2014; Savage, Palmer, & Martin, 2014), to date no review or synthesis examining this association within the homeless population has been completed.

Therefore, this review will seek to explore the attachment styles found within the homeless population and the role these play in the development of a variety of maladaptive behaviours. In addition, it is hoped that such a review will uncover gaps in the current literature alongside new avenues for possible intervention and future research.

## 1.2 Method

### 1.2.1 Search Strategy

A systematic search of the literature was conducted in order to identify empirical studies examining attachment and the role this plays in the development of maladaptive behaviours in homeless populations. The following electronic bibliographic databases were searched for relevant articles: PsychInfo, PsyArticles, Medline, Cumulative Index of Nursing Allied Health Literature (CINAHL; all through EBSCO) and Web of Science. The search took place in December 2017 and due to the novelty of this review, no time limitations were applied to the search in order to capture the full range of literature available. Experts within the field of homelessness research were also contacted to corroborate the novelty of the review topic and to contribute relevant literature.

### 1.2.2 Search Terms

The search terms used to identify relevant studies are shown in Table 2. These were chosen to be as sensitive as possible and derived via consultation with experts within the field and/or previous relevant articles. For the purposes of the review, homelessness was defined as being without suitable or permanent dwelling and included street homeless, sheltered housing and temporary accommodation such as ‘sofa surfing’. No minimum time frame was specified for this in the search. The range of maladaptive behaviours included in the review derived from parts of the Maladaptive Behaviours Questionnaire (MBQ; Kingston, Clarke, Ritchie, & Remington, 2011) and from previous empirical papers exploring maladaptive behaviours within the homeless population (Powell & Maguire, 2017; Maguire,

Green, & Willoughby, 2017). The MBQ, designed as a single measure of maladaptive behaviour within clinical populations, was considered a suitable framework to use within this review given its wide usage within homeless research (Kingston et al., 2011; Keohane, 2014) and its inclusion of the majority of behaviours associated with tenancy breakdown and homelessness in the literature (Kingston et al., 2011). Combinations of these search terms were investigated across all fields including title, abstract and subject, using the Boolean operator AND.

Table 2:*Search terms entered into the five databases.*

| *Search Term* | *Definition* |
|---|---|
| *#1 Search term* | homeless* OR rough sleep* OR sofa surf* OR double up housing OR non-permanent hous* OR living on the street* OR *squat* OR unhous* OR roofless* OR runaway* OR unsheltered OR houseless |
| *#2 search term* | attach* |
| *#3 search term* | substance-related disorder OR substance abus* OR drug abus* OR addict* OR drug addict* OR intravenous drug* OR drug use* OR narcotic* OR alcohol* OR substance use* OR agress* OR violen* OR suic* OR self harm* OR self injur* OR self mutilat* OR unsafe sex* OR sexual risk* OR sexual promisc* OR maladaptive behavi* OR maladaptive cop* OR problem* behavi* OR disruptive behavi* |

* Used to denote all words starting with the prefix (e.g. attach* includes attached, attachment).

### 1.2.3 Eligibility Criteria

Table 3 outlines the pre-determined exclusion and inclusion criteria for the systematic search. Eligible papers were written in English and published within a peer reviewed journal. As there has been no previous review within this area, all study designs were considered; however, to ensure that measurable outcomes could be compared, qualitative studies were excluded. Studies were included if they contained a measure of attachment, a measure of maladaptive behaviour (i.e. alcohol/drug use, self-harm/suicidality, sexual promiscuity and/or aggression) and explored the association between these measures. Furthermore, whilst papers had to include a homeless population sample, no limits on age or gender of participants was set. However, studies were excluded if the data from homeless participants was indistinguishable from other populations. Studies with non-homeless comparison groups were also included.

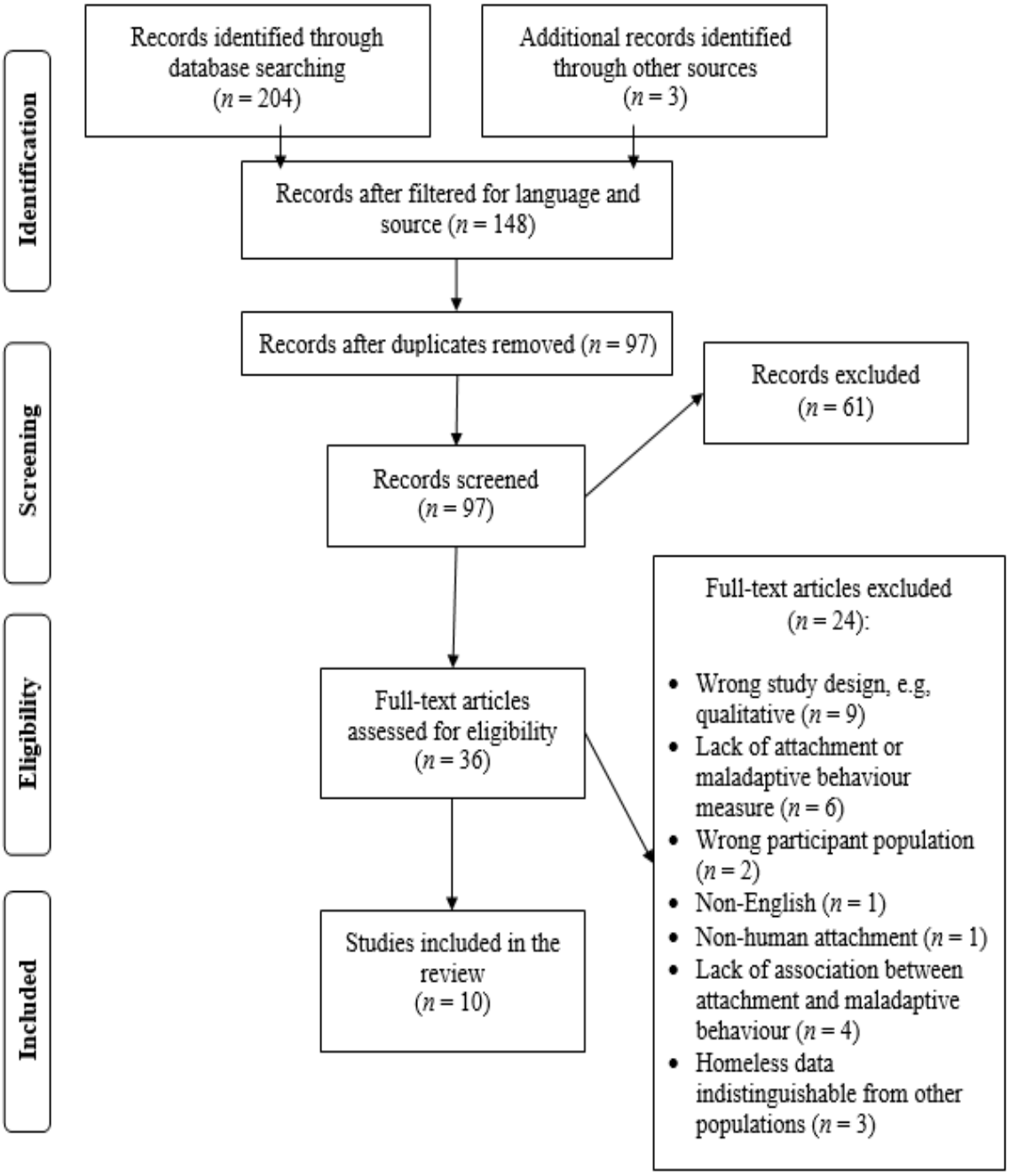
Table 3. *Eligibility criteria for papers included in the review.*

| *Inclusion Criteria* | *Exclusion Criteria* |
|---|---|
| • Published within a peer reviewed journal.<br>• Study includes data taken from a homeless sample.<br>• Written in English.<br>• Study measures attachment alongside maladaptive behaviours and explores an association between the measures. | • Book chapter or review papers.<br>• Qualitative studies.<br>• No measure of attachment or maladaptive behaviour.<br>• Non-human attachment (i.e. attachment to god, animals).<br>• Data from homeless participants indistinguishable from other populations.<br>• Paper explores intergenerational transmission across families, maternal/paternal attachment with infant or 'at risk' of homelessness samples. |

### 1.2.4 Data Selection

The initial searches yielded a crude total of 207 papers. These were then filtered by language and source (i.e. English and peer-review journals only) leading to 148 papers, of which 51 were duplicates. The titles and abstracts of the remaining papers were screened ($n$= 97) with a further 61 papers being deemed not relevant. The remaining 36 papers underwent full text review with a sample of 10 studies being deemed eligible for the final review (Outlined in table 4). Reference sections and citation indexes from pertinent studies were also hand searched for additional relevant articles ($n$ = 3). The study selection process and search results are outlined in Figure 1.

Figure 1. *Flow diagram of search selection process and search results.*



### 1.2.5 Quality Assessment

The methodological quality and risk of bias for each shortlisted study was assessed using the 14-item National Heart, Blood and Lung Institute (NHLBI) Quality Assessment Tool for Observational Cohort and Cross-Sectional Studies (NHLBI, 2014) or the 12-item NHLBI Quality Assessment Tool for Case Control Studies (NHLBI, 2014). Dependant on the information provided in the article each of the items were scored as “yes”, “no”, “not reported” or “not applicable”. An overall quality score (i.e. percentage of the maximum possible score) was calculated for each study and a score rating was also given, i.e. a score of ≥ 70% was rated as good, 50-69% as fair and <50% as poor (Osinubi et al., 2018). As previously recognised there are few validated tools for assessing risk of bias in non-randomised observational studies (Stang, 2010; Saltzman & Liechty, 2016). However, the two NHLBI tools were selected based on the rigorous and expert nature of their development and the availability of detailed user documentation (Saltzman & Liechty, 2016).

Table 4. *Data extraction*

| Author and origin | Design and aims | Sample size and characteristics | Attachment measure | Maladaptive behaviour measure | Summary of findings | Quality assessment |
|---|---|---|---|---|---|---|
| Benda (2003a)<br><br>USA - unspecified | Cross sectional design.<br><br>To determine what factors discriminate between non-suicidal homeless veterans, those experiencing suicidal thoughts and those who have attempted suicide. | 600 male homeless war veterans.<br><br>Mean age: 50.3<br><br>Recruited from attending a treatment program for substance abuse.<br><br>Systematic sampling (every 10th person) | Familial attachment measured using:<br><br>Family relationship problems subscale from Hudson's (1990) Multi problem screening inventory (MPSI).<br><br>Higher scores on familial attachment indicative of more securely attached. | Suicidal thoughts measured using:<br><br>Suicidal thoughts subscale from the MPSI. | Higher scores on familial attachment associated with non-suicidal classification.<br><br>Familial Attachment significantly discriminated between non-suicidal homeless veterans and those experiencing suicidal thoughts/ attempted suicide. | 66.6%<br><br>Fair |
| Benda (2003b)<br><br>USA – unspecified | Case control design.<br><br>To assess differences in interrelationships between factors (substance abuse and depression) for homeless and domiciled veterans. | 300 male homeless war veterans and 300 domiciled veterans.<br><br>Mean age: 51.2<br>Recruited from a Veteran's affairs Medical Centre (VAMC)<br><br>Systematic sampling (every 10th person) | Familial attachment measured using:<br><br>Family relationship problems subscale from Hudson's (1990) Multi problem screening inventory (MPSI).<br><br>Higher scores on familial attachment indicative of more securely attached. | Substance abuse measured using:<br><br>Alcohol abuse and drug abuse subscales from the MPSI. | Attachment to caregivers was inversely related to substance abuse in both groups ($p < .01$).<br><br>This inverse relationship was considerably larger among homeless than among domiciled veterans. | 83.3%<br><br>Good |

| Author and origin | Design and aims | Sample size and characteristics | Attachment measure | Maladaptive behaviour measure | Summary of findings | Quality assessment |
|---|---|---|---|---|---|---|
| Benda (2005)<br><br>USA – unspecified | Cross sectional design.<br><br>To examine gender differences in predictors of suicidal thoughts and attempts among homeless veterans who abuse substances. | 315 male and 310 female homeless veterans.<br>Mean age: Data not given.<br>Recruited from an inpatient (VAMC)<br><br>Opportunity sampling. | Parent attachment measured using:<br>The inventory of Parent and Peer Attachment (IPPA, Armsden & Greenberg, 1987).<br>Higher scores associated with more securely attached. | Suicidal thoughts measured using:<br><br>Suicidal thoughts subscale from the MPSI. | Lower scores on attachment to caregivers -significantly related to contemplating and attempting suicide in both genders ($p<.05$)<br><br>Lower scores on attachment to caregivers - more significantly related to contemplating suicide in females ($p<.01$) than males ($p<.05$).<br>No other significant gender differences exist. | 66.6%<br>Fair |
| Benda & Belcher (2006)<br><br>USA – unspecified | Cross sectional design<br><br>To examine the role of attachment (and forgiveness) in alcohol and drug abuse among homeless veterans. | 315 male and 310 female homeless veterans.<br>Mean age: Data not given.<br>Recruited from an inpatient (VAMC)<br>Opportunity sampling. | Parent attachment measured using:<br>The inventory of Parent and Peer Attachment (IPPA, Armsden & Greenberg, 1987).<br>(Higher scores associated with more securely attached) | Substance abuse measured using:<br>Alcohol abuse and drug abuse subscale from the MPSI. | Attachment to parents - inversely related to substance abuse ($p <.01$).<br>Attachment to parents - indirectly related to substance abuse through other constructs (e.g. abuse, spiritual wellbeing) ($p<.05$). | 72.7%<br>Good |

| Author and origin | Design and aims | Sample size and characteristics | Attachment measure | Maladaptive behaviour measure | Summary of findings | Quality assessment |
|---|---|---|---|---|---|---|
| Kidd & Shahar (2008)<br><br>USA/Canada – New York & Toronto. | Cross sectional design<br><br>To examine the protective role of secure attachment in homeless youths against identified risks (e.g. sex trade involvement, substance abuse, suicidal ideation) | 208 homeless youths (i.e. no fixed abode or living in a shelter).<br><br>Gender: 59% Male, 40% female and 2 transgender.<br>Mean age: 20.25 years.<br>Recruited off the street or in agencies.<br>Opportunity sampling. | Attachment style was measured using:<br><br>Relationship Questionnaire (RQ; Bartholomew & Horowitz, 1991). | Sex trade involvement measured using:<br><br>A single item created by the author.<br><br>Substance abuse: 7 items identifying type and frequency of drug use created by author.<br><br>Suicidal ideation: Derived from 4 item scale (Lewinsohn, Rohde & Selley, 1996). | Sex trade involvement = significantly associated with an elevation in fearful attachment ($p<.05$). No other significant correlations were found.<br><br>Suicidal ideation = significantly associated with fearful ($p<.001$) and pre-occupied attachment ($p<.05$) and inversely associated with secure attachment ($p<.05$).<br><br>No significant associations between any of the attachment styles and substance abuse were found. | 63.6%<br>Fair |

| Author and origin | Design and aims | Sample size and characteristics | Attachment measure | Maladaptive behaviour measure | Summary of findings | Quality assessment |
|---|---|---|---|---|---|---|
| Letcher &Slesnick (2013)<br><br>USA – Midwestern city | Cross sectional design<br>To assess the relationship between sexual activity/ substance abuse and attachment anxiety/ avoidance<br>Data collected was part of a larger longitudinal study | 73 runaway youths.<br><br>Gender: 60% Female, 40% Male.<br><br>Mean age: 15.3 years (aged between 12-17)<br>Recruited from a runaway shelter.<br><br>Opportunity sample. | Attachment anxiety and avoidance with romantic partner measured using:<br><br>Adult Attachment Scale (AAS; Collins and Read, 1990) | Sexual activity: Items taken from the Health Risk Survey (Kann et al., 1989) and Homeless Youth Questionnaire (Johnson et al., 1996).<br>Substance abuse: 90-D Drug interview (Miller 1996). | Both attachment avoidance and attachment anxiety were significantly related with age at first drug use ($p<.05$).<br><br>No significant relationships between attachment avoidance or attachment anxiety and sexual risk variables.<br>No significant gender differences were found. | 72.7%<br>Good |
| Rodell, Benda & Rodell (2003)<br><br>USA - Unspecified | Cross sectional design.<br><br>To examine the relationship between attachment to caregivers and duration/intensity of alcohol and drug use. | 188 homeless adults (178 male and 10 female)<br><br>Mean age: 44.5 years.<br>Recruited from a treatment centre for substance misuse.<br>Random sample selected from population every 6 months. | Caregiver attachment measured using:<br><br>Family relationship problems subscale from MPSI.<br><br>Higher scores on familial attachment indicative of more securely attached. | Suicidal thoughts: The suicidal thoughts subscale from the MPSI.<br><br>Substance abuse:<br><br>Addiction Severity Index (ASI; McLellan et al., 1992). | Secure attachment to caregivers - found to be inversely related to suicidal thoughts ($p<.01$)<br>Attachment to caregivers - significantly related to both intensity and duration of drug and alcohol abuse.<br>Duration and intensity of substance use amplified the effects of attachment style on suicidal thoughts | 63.6%<br>Fair |

| Author and origin | Design and aims | Sample size and characteristics | Attachment measure | Maladaptive behaviour measure | Summary of findings | Quality assessment |
|---|---|---|---|---|---|---|
| Stein, Milburn, Zane & Rotheram-Borus (2009)<br><br>USA-Los Angeles | Cross sectional design.<br><br>To examine the role of parental attachment on problem behaviours (i.e. substance abuse and risky sex behaviours) amongst homeless and runaway youths. | 501 homeless and runaway adolescents (253 males and 248 females)<br>Mean age: 17 years.<br>Recruited from 30 sites (17 shelters/drop-in shelters, 13 street 'hangout' sites.<br><br>Opportunity sample | Parental attachment measured using:<br>6 items created by the authors alongside an expert panel on attachment.<br>Father and mother attachment scores were considered separately.<br>Higher scores on parental attachment suggestive of more securely attached. | Substance abuse: 5 items created by author looking at type of drug use and frequency.<br>Survival sex: 3 items created by the author concerning trading sexual behaviours for money.<br>Delinquency:3 items created by the author concerning delinquent behaviour | Attachment to father was significantly related to lower levels of substance abuse and delinquent behaviour.<br><br>Attachment to mother was significantly related to lower levels of survival sex.<br><br>No significant differences for gender or time away from home were found for these results. | 50%<br>Fair |

| Author and origin | Design and aims | Sample size and characteristics | Attachment measure | Maladaptive behaviour measure | Summary of findings | Quality assessment |
|---|---|---|---|---|---|---|
| Tavecchio (1999)<br><br>Europe – Netherlands. | Case control design.<br><br>To examine the relationship between attachment and delinquent behaviours in homeless versus institutional youths. | 79 homeless (54 boys and 25 girls) and 83 institutional adolescents (48 boys, 35 girls)<br>Mean age: 18 years.<br>Recruitment:<br>Homeless – a number of Youth Emergency Services.<br>Institutional – A number of institutions for residential care.<br>Opportunity sampling. | Attachment measured using:<br><br>Attachment Style Questionnaire (ASQ; Feeney, Noller, & Hanrahan, 1994). | Delinquency measured using:<br><br>Anti-Social Behaviour Inventory (ASBI; Wouters & Spiering, 1990) | In the homeless group delinquency correlated negatively with secure attachment ($p<.01$).<br><br>Attachment shown to predict 10% of variance in delinquency scores.<br><br>No significant correlation between these factors were found in the institutional group. | 50%<br><br>Fair |
| Taylor-Seehafer, Jacobvitz & Steiker (2008)<br><br>USA – Unspecified | Retrospective design.<br><br>To examine the relationship between attachment style and drug/alcohol abuse in a sample of homeless adolescents. | 25 homeless older adolescents (13 males. 12 females).<br>Mean age: 19.8 years.<br><br>Recruited through a street outreach program.<br>Opportunity sample. | Attachment measured using:<br><br>The Adult attachment Interview (AAI; Main et al.,1985) | Substance abuse: The Simple Screening Instrument for alcohol or other drug abuse (US Department of Health and Human Services, 1995). | No statistically significant correlations were found for attachment pattern and alcohol/drug abuse.<br><br>Paper queries sample size. | 50%<br><br>Fair |

## 1.3 Results

### 1.3.1 Study and Participant Characteristics

A total of ten quantitative papers were included in the review, the earliest being published in 1999; all others being published between 2003 and 2013 (Outlined in table 4). Of these papers, seven used a cross sectional design, two used a case-control design and one used a respective design. Nine of the included studies reported primary data sources, with one paper using data taken from a larger longitudinal study (Letcher & Slesnick, 2013). Data analysis was predominately correlational and regression approaches, with only three studies incorporating structural equation modelling or moderation analysis in their results (Benda & Belcher, 2006; Benda, 2003b; and Rodell, Benda, & Rodell, 2003)

Within the papers that reported time spent homeless (*n*=3), average length ranged from 7- 35 months and in the papers that reported ethnicity (*n*=9) participants were predominantly White (47.2%) followed by Black American (29.1%). Individual sample sizes ranged from 25 – 625 participants.

From those selected, five papers used youth samples with the remaining five using adult samples. Recruitment took place across a variety of settings including homeless/runaway shelters (*n* = 1), treatment centres for substance abuse (*n*= 5), on the streets (*n*=2), within emergency service departments (*n*=1), and at a street outreach programme (*n*=1). The majority of studies used a non-probability sampling technique, i.e. opportunistic (*n*= 7) and systematic (*n*=2), with only one study using random selection (Rodell et al., 2003).

Of the ten studies, three used an all-male sample, and for the remaining studies gender was deemed relatively equal (44.1% female). One study also incorporated data from two participants identifying as transgender (Kidd & Shahar, 2008) and four studies focused purely on homeless veterans. Furthermore, in terms of location, the majority of studies were completed in North America (USA and Canada; *n* = 9), with only one in the Netherlands (Tavecchio, 1999).

### 1.3.2 Measures

**Attachment:** Measures used to assess attachment varied greatly across the ten studies, with seven different measures being used and only two measures being used in more than one study, namely, the Inventory of Parent and Peer Attachment (IPPA; Armsden & Greenberg, 1987) and the Family Relationship Problems subscale from the Multi Problem Screening Inventory (FRP-MPSI; Hudson, 1990). Of these measures, the majority identified attachment styles through the use of self-report (*n*= 6), with only one measure using a semi-structured interview format (i.e. the Adult Attachment Interview, AAI; Main, Kaplan, & Cassidy, 1985 in Taylor-Seehafer et al., 2008). All of these measures were validated with the exception of one paper (Stein et al., 2009). In this one, an expert panel and alternative measures were drawn on to create the study specific measure of attachment.

Most measures related to adult attachment, namely, adult attachment in general (*n* =2), attachment to family (*n* =3) and romantic attachment (*n* =1). Whilst one measure focused on childhood attachment experiences (the AAI; Main et al., 1985). In addition, one study compared attachment styles between different attachment figures, i.e. attachment to mother vs. attachment to father (Stein et al., 2009).

Whilst all measures assessed the broad constructs of insecure vs secure attachment styles, one measure considered this within the dimensions of anxious and avoidant attachment (i.e. Adult Attachment Scale – Revised, Revised AAS; Collins & Read, 1990) and three others as part of a categorical measure using a four-fold typology, e.g. secure, insecure-anxious/ambivalent, insecure-avoidant, insecure-disorganised (Attachment Styles Questionnaire, ASQ; Hazan & Shaver, 1987). Full details of the tests used in each article can be found in Appendices A1 and A2.

**Maladaptive Behaviours:** Fourteen measures of maladaptive behaviour were administered across the ten studies. These measures covered six different topics: drug abuse (*n* = 3), alcohol abuse (*n* = 1), alcohol and drug abuse combined (*n* = 3), sexual promiscuity (*n* = 3), suicidal ideation (*n* = 2) and aggression (*n* = 2). No studies included measures of self harm/self injury. As with the attachment measures, the majority of these were self-report (*n* = 12) with only two studies opting for a structured interview format, namely, the Form 90-D Drug Interview (Miller, 1996, in Letcher & Slesnick, 2013) and the Addiction Severity Index (ASI; McLellan et al., 1992, in Rodell et al., 2003). Furthermore, only three of the measures were used across multiple studies, i.e. the suicidal thoughts, alcohol abuse, and drug abuse subscales from the Multi Problem Screening Inventory (Hudson, 1990).

Of the fourteen measures, seven measures were validated, whilst the remaining seven were either study specific measures or questions taken from other papers of a similar topic. Articles also varied in the number of maladaptive behaviours they included, ranging from one to three, with over half of the studies using two or more measures (58.3%).

### 1.3.3 Quality Assessment

The ten studies shortlisted for the review were assessed for their methodological quality and risk of bias using either the 14-item NHLBI Quality Assessment Tool for Observational Cohort and Cross-Sectional Studies (*n* = 8; NHLBI, 2014) or the 12-item NHLBI Quality Assessment Tool for Case Control Studies (*n* = 2; NHLBI, 2014) depending on the study design (See Appendices A3 to A6 for further information).

According to the NHLBI, three papers were assessed as good and seven papers as fair, representing minimal and moderate risk of bias respectively. For the cross-sectional (*n* = 7) and retrospective studies (*n* = 1), strengths included: using clearly stated objectives, using clearly specified and defined sample populations and identification of key confounding variables. Furthermore, the majority of studies used both validated exposure (i.e. independent; *n* = 7) and outcome (i.e. dependent; *n* = 6) variables. Some weaknesses included lack of sample size justification, lack of assessor blinding and lack of a sufficient timeframe to see an effect.

In terms of the case-controlled studies (*n* = 2), strengths included clear differentiation between cases and controls, and clear and consistent application of definitions, inclusion/exclusion criteria and processes involved in identifying cases and controls. Weaknesses were similar to those found in the cross-sectional studies around sample size justification and blinding of assessors.

### 1.3.4 Attachment within the Homeless Population

Whilst this information was not consistently available, low levels of attachment security were found across a number of the studies. For most this was

demonstrated by mean scores falling within the lower end of an insecure vs secure attachment dimension (e.g. Benda & Belcher, 2006; Benda, 2005).

However, two studies provided information on the attachment styles of homeless youths using categorical groupings (Kidd & Shahar, 2008; Taylor-Seehafer, 2008), namely the Relationship Questionnaire (RQ; Bartholomew & Horowitz, 1991). These suggested lower levels of secure attachment (Mean = 2.85) amongst homeless individuals compared to insecure attachment styles, i.e. fearful, preoccupied and dismissing (combined Mean = 3.25). However, when considered separately, low levels of preoccupied attachment were also found (Mean = 2.82) with fearful (Mean = 3.75) followed by dismissive (Mean = 3.17) being the highest reported (Kidd & Shahar, 2008).

Additionally, in Taylor-Seehafer et al's (2008) study using the AAI (Main et al., 1985) on 25 homeless adolescents, no participants were coded as having a secure attachment pattern, compared to four being assigned the insecure-dismissive pattern, one being assigned the insecure-pre-occupied pattern and 15 being assigned a disorganised pattern. Furthermore, five participants were assigned 'cannot classify', which within the study was described as having a 'severe lack of attachment organisation, rare within the healthy population'. Whilst these findings are similar to those found in Kidd and Shahar's (2008) study, the generalisability of these results are questioned given the small sample size in this study.

### 1.3.5 Prevalence of Maladaptive Behaviours

A number of different maladaptive behaviours were identified in this review; the levels of which varied across studies. In terms of substance abuse, high levels of

both alcohol and drug use were identified; taken together self-reported rates ranged from 45.7% to 81.5% (Benda, 2003b; Taylor-Seehafer et al., 2008).

Rates of aggression were high, particularly in the youth samples. In one study, approximately 25% of participants reported using threatening and physical aggression (Tavecchio, 1999) which was significantly higher than the non-homeless control. High levels of 'delinquent' anti-social behaviour were also reported, particularly in men (48% men to 30% female; Stein et al., 2009). Sexual risk taking was reported in three studies, and whilst rates of 11-15% were identified in terms of trading sex for money (Kidd & Shahar, 2008; Stein et al., 2009) these are considered relatively low compared to other studies reporting sexual risk taking within the homeless population (Nyamathi, Leake, Keenan, & Gelberg, 2000).

High levels of suicidality were also found across studies, particularly, but not exclusively, in females. In terms of contemplating suicide for both genders, rates ranged from 40% to 46.5%, whilst rates of attempting suicide ranged from 23.7% to 31.6% (Benda, 2005; Benda, 2003; Rodell et al., 2003).

### 1.3.6 Associations between Attachment and Maladaptive Behaviours

Whilst low levels of attachment security and high levels of maladaptive behaviours have been indicated in the included papers, the following section considers the association between attachment style and specific maladaptive behaviours in more detail.

**Substance Abuse:**

Seven papers within this review explored the association between attachment and substance abuse within the homeless population; representing the most commonly identified behaviours. Of those seven articles, five considered alcohol and

drug use together using the term ‘substance abuse’, whilst two papers looked purely at drug use. No papers reported findings on alcohol use alone.

The results from most of these studies indicated that insecure attachment was strongly related to higher levels of both substance abuse and drug abuse, and this was found across gender and age differences (adults vs. adolescents; Benda & Belcher, 2006; Benda 2003b). One study also compared homeless veterans to domiciled individuals and found this association to be larger within the homeless group. Furthermore, one study considered the differences between mother vs. father attachment and found only attachment to father to be associated with levels of substance use (Stein et al., 2009).

Alongside severity of drug use, attachment insecurity was also significantly related to duration of substance abuse (Rodell et al., 2003) and age at first drug use (Letcher & Slesnick, 2013). Furthermore, in Letcher and Slesnick’s study (2013), the association between attachment and age at first drug use was found in both insecure-avoidant and insecure-anxious dimensions. However, these associations were only investigated in one study each.

Two studies also explored the role of attachment using structural equation modelling (Benda, 2003b; Benda & Belcher, 2006). Both confirmed the correlation between attachment and substance use and found attachment to also be indirectly related to substance abuse through other constructs, such as abuse and spiritual well-being.

Contrary to the previous findings, two studies found no association between attachment and substance use in youth samples (Taylor-Seehafer et al., 2008; Kidd and Shahar, 2008). Suggesting there may be no link between these two factors.

**Suicidality:**

Four papers within this review explored the association between attachment and suicidality. Whilst all studies measured suicidal ideation, two studies also considered suicidal attempts in their results (Benda, 2003a, 2005). Most studies reported significant negative correlations between secure attachment and suicidality.

One study assessed this association in homeless youths and found suicidal ideation to be positively correlated to pre-occupied and fearful attachment on the RQ, whilst being negatively correlated to secure attachment (Kidd & Shahar, 2008). The remaining three studies focused on homeless veterans, with level of care giver attachment being found to discriminate between veterans classified at non-suicidal and those who were thinking about suicide or had attempted it (Benda, 2003a). Furthermore in one study, attachment was found to strongly predict suicidality although this was superseded by intensity of drug and alcohol use, sexual abuse and a number of psychiatric admissions (Rodell et al., 2003)

Gender differences were also noted in the association between attachment and suicidality. In one study, whilst attachment to carer was significantly related to both contemplating and attempting suicide in both genders, this was most significant for females contemplating suicide than men (Benda, 2005). However, unexpectedly and unlike the previous findings a positive correlation between attachment security and suicidality was found. Suggesting that secure attachment may be associated with increased suicidality.

**Aggression:**

Only two youth studies within this review considered the association between attachment and aggression/anti-social behaviour (Stein et al., 2009; Tavecchio,

1999); both finding a significant negative correlation between attachment and delinquent behaviour, particularly in males (Tavecchio, 1999).

Using a case-control design, Tavecchio (1999) compared delinquent behaviour in homeless youths with youths in residential care, and found a significant negative correlation between delinquency and secure attachment, but only in the homeless sample. Furthermore, using regression analysis, attachment was shown to predict 10% of the variance in delinquency scores, again only within the homeless group.

Similar findings were found within Stein et al's (2009) study, however as previously found with regards to substance use, a significant correlation was only found for paternal attachment.

**Sexual risk taking:**

Three studies examined the link between attachment and sexual-risk taking, all of which used a youth sample. However, results were mixed, potentially due to the variety of measures used to identify 'sexual–risk taking'.

Two studies found significant correlations between attachment and sexual risk taking (Kidd & Shahar, 2008; Stein et al., 2009), namely, sex trade involvement and levels of survival sex. However, this association was only found with regards to a fearful attachment style (Kidd & Shahar, 2008) and attachment to mother (Stein et al., 2009).

Conversely, one study found no significant relationships between insecure attachment (i.e. anxiety or avoidance) in either of their sexual risk behaviours, i.e. number of lifetime partners, age at first intercourse (Letcher & Slesnick (2013).

## 1.4 Discussion

This systematic review had two aims: firstly, it sought to explore the attachment styles and maladaptive behaviours found within the homelessness population, and secondly, to explore the role of attachment in the development of such behaviours, i.e. determine whether particular attachment styles are associated with or increase a person's likelihood of developing maladaptive behaviours. A deliberately broad systematic search was conducted of the literature resulting in a total of ten quantitative papers being deemed eligible for inclusion. All ten papers were then assessed for risk of bias using a detailed quality assessment (NHLBI, 2014).

### 1.4.1 Main findings

**Attachment and maladaptive behaviours within the homeless population:**

Whilst the data was limited, this review identified low levels of attachment security and high levels of attachment insecurity within the homeless population. This finding is consistent with previous studies on homeless people where a low incidence of secure attachment compared to the general population has been found (Vinay, Salvi, & N'jin, 2010; Rodriguez-Pellejero & Nunez, 2018). For the majority of studies, low levels of secure attachment were demonstrated by mean attachment scores falling within the lower end of an insecure vs secure attachment dimension. However, two studies using categorical definitions of attachment, found high levels of two particular insecure attachment styles, namely disorganised and fearful attachment (Kidd & Shahar, 2008; Taylor-Seehafer, 2008). This again reflects the pattern emerging in the homeless and attachment literature (Franskoviak, 1999;

Vinay et al., 2011), although the small number of papers restricts the conclusions that can be drawn.

A variety of maladaptive behaviours within the homeless population were also identified. Substance abuse (both alcohol and drug use) was reported most often and appeared the most prevalent, with self-reported rates ranging from 45.7% to 81.5%. Rates of delinquent behaviour and suicidality were also deemed high, with rates of 48% and 46.5% being reported, respectively. Furthermore, gender was shown to vary between these behaviours, with males reporting higher rates of delinquent behaviour whilst females reported higher rates of suicidality. Rates of sexual risk taking were also identified (i.e. 11-15%). However, this was considered relatively low when compared to the prevalence reported in other studies (i.e. 60%; Nyamathi et al., 2000).

**Role of attachment:**

Overall, this review identified an association between high levels of maladaptive behaviour and lower levels of attachment security in most studies. This finding is concordant with the current understanding of attachment theory and its association with self-regulation and subsequent maladaptive behaviour use (Priddis & Wallace, 2011; Schindler et al., 2007). However, the strength of this relationship and the number of papers in support of this association varied between behaviours.

The majority of articles examined the link between substance abuse and attachment. In these papers, attachment security was consistently found to be negatively correlated to both ‘drug use’ and ‘drug and alcohol use’ combined, a finding which has also been confirmed within other groups, e.g. clinical populations (Schindler et al., 2005). For the majority of papers this was in regards to severity,

although two studies found significant associations between attachment security and duration and age at first drug use (Rodell et al., 2003; Letcher & Slesnick, 2013). However, the small sample sizes and non-validated measures of substance use used in these studies may in some way account for these results. In addition, one study found this association only when paternal attachment was examined separately (Stein et al., 2009). Despite only being drawn from a single study, this finding calls into question the differing effect of parental attachment and the potential importance of considering a range of different attachment relationships in future research in this area.

Both suicidality and delinquent behaviour were also found to be negatively correlated to attachment security; findings which are consistent with research in both clinical and non-clinical, youth and adult populations (Wright, Briggs, & Behringer, 2005; Grunebaum et al., 2010). For suicidality, this relationship was found across age and gender. Furthermore, in Kidd and Shahar's (2008) study significant correlations, in the expected directions, were found for three of the four attachment categories: pre-occupied, fearful and secure. Similar findings were also found in articles considering delinquent behaviour and attachment. However, with findings only from two papers both of which were from youth samples, only tentative conclusions from these results can be made.

Despite previous research linking attachment insecurity with sexual risk-behaviours (Ahrens, Ciechanowski, & Katon, 2012, Olley, 2010), mixed findings regarding this association were found within the present review. Whilst some results demonstrated significant correlations in line with this research, findings were inconsistent. For example, Letcher & Slesnick (2013) found no significant

relationships between the attachment anxiety or avoidance dimension in either of their sexual risk behaviours, i.e. number of lifetime partners, age at first intercourse. However, the paper queries whether a ceiling effect might have occurred with the majority of the sample being 'highly sexually active' from a young age. Consequently due to a reduced variability in the sample, the ability to detect differences may have been compromised.

Furthermore, the wide variety of methods used to define and measure sexual-risk taking, together with only youth samples being used, prevents firm inferences being made.

### 1.4.2 Critical review of the literature

Although the literature is relatively scarce, the findings in this review appear to be consistent with similar reviews exploring the link between attachment and a range of maladaptive behaviours within other populations (Schindler et al., 2005; Gvion & Levi-Belz, 2018). However, there are limitations to note and these should be considered when interpreting the present review's findings.

*Study design and participants:* Variations across study design and participant characteristics were found in the included studies. Individual sample sizes ranged from 25 to 625, and length of time spent homeless varied widely between studies, i.e. from 7 to 35 months, making comparisons between studies difficult. Studies targeted a range of homeless populations, i.e. street homeless, hostel residents, and whilst this provided a breadth of information, the depth of information needed to make inferences based on this information was lacking. In addition, a large proportion of studies employed non-probability sampling methods, i.e. opportunity sampling, and consequently the samples used may not be representative of the whole population.

The majority of studies used a cross sectional design, with only two studies utilising a comparison group. Therefore, it is not possible to draw definite conclusions around causality. Whilst one can speculate that insecure attachment, usually developed in childhood and considered relatively stable over the lifespan, is a risk factor for maladaptive behaviours (Schindler et al., 2005), the direction of this relationship cannot be assumed. Furthermore, in light of recent research suggesting that attachment styles can alter following certain events, e.g. challenging life experiences, alternative support figures (Saunders et al., 2011), future longitudinal studies to explore this would be beneficial.

A strength of this review is that included studies have been drawn from different age ranges, genders and locations; suggesting that the present findings are consistent across groups. However, there is an over-reliance on youth, veteran and American samples which may limit the generalisability of these findings. For example, a study comparing homeless veterans and non-veterans found the former more likely to be older, to be or to have been married and to be better educated than the latter. They also reported a higher number of medical problems and were more likely to report a diagnosis of major depression and PTSD than non-veterans (Ramaswamy et al., 2017). Consequently, findings taken from this specific sample population may not fully equate to other homeless subgroups. Future studies would benefit from considering the full spectrum of homeless people within their research.

*Measures and analysis:* Studies relied heavily on self-report measures, which are highly susceptible to demand characteristics and social desirability. Not only have these type of measures been shown to be influenced by attachment styles (Cassidy, 1994) but homeless individuals may not report their true feelings out of

fear of further stigmatisation. Future research may benefit from objective measures of both attachment and maladaptive behaviours, e.g., urine samples to test substance abuse.

A wide variety of assessment measures were identified within this review; a number of which were unvalidated. For example, in some cases, use of maladaptive behaviour was calculated based on purely a 'yes' vs. 'no' response, whilst in other situations inconsistencies in the definition of the behaviour existed, i.e. delinquent behaviour, As a result it has been difficult to make comparisons and draw robust conclusions.

Attachment style was assessed using seven different measures; six being self-report and one using an interview format, i.e. the AAI (Main et al., 1985). Whilst the AAI is thought to examine unconscious attachment processes and therefore potentially be a more robust measure of attachment style (Jacobvitz, Curran, & Moller, 2002; Shemmings, 2004), the small sample size in the study using this measure ($n$ = 25) prevents any further weight being given to their results (Taylor-Seehafer et al., 2008).

In addition, the method of calculating attachment styles varied considerably. A number of papers used widely recognised categorical measures to explore attachment, e.g. The RQ (Bartholomew & Horowitz, 1991), whereas the majority used measures to assess the broad constructs on insecure vs. secure attachment. Whilst all these papers drew on attachment theory (Bowlby, 1977; Ainsworth et al., 1978) and identified these tools as 'measures of attachment', there is uncertainty around whether such tools completely represent the constructs they aim to measure (Stein et al., 2009). Furthermore, it is widely agreed that measures identifying

individuals on purely a secure vs insecure continuum are not sensitive enough to capture the complexities that make up the attachment framework. Current thinking around attachment supports the use of dimensional measures of 'anxious' and 'avoidant' attachment, e.g. the revised AAS (Collins & Read, 1990), as seen in Letcher and Slesnick's study (Mikulincer & Shaver, 2007). Therefore, future research within the homeless population using these dimensional measures of attachment is required.

The majority of studies focused purely on correlational data; further limiting the ability of this review to infer causation. Furthermore, whilst a handful of articles used structured equation modelling and moderation analysis to increase the robustness of these findings, a diverse range of additional variables were explored and subsequently the generalisability of these findings is limited. However, given the mixed findings within this review and previous research questioning the direct path between early attachment and later risk behaviours (Greenberg et al., 2001; Weinfield et al., 2000), there is a strong argument for further mediational research. The effects of both childhood adversity and self-regulation, i.e. management of emotions and behaviours, within the homeless population might be particularly pertinent given their strong theoretical associations with different attachment styles (Mikulincer & Shaver, 2008).

### 1.4.3 Limitations of the literature review

The review has some limitations to note, including elements of publication bias. Possible sources include the inclusion of only published peer-reviewed journal articles and articles written in English. Although a certain standard of quality comes from using peer-reviewed only articles, it is plausible that valuable information

written on the homeless population may have been found within the gray literature. In addition, it could be argued that studies showing significant results are more likely to be published than those showing non-significant findings, again creating a risk of bias. Therefore, it may be important for future reviews to consider alternative languages and publication types.

The lack of second reviewer in the screening process and selection of final articles could also be seen as a limitation of this review. Although a structured exclusion/inclusion criteria was followed to reduce a reviewer bias, random error/mistakes or a misinterpretation of findings from reading and reviewing studies may have occurred (McDonagh et al., 2008); something potentially negated by a second reviewer.

In addition, the methodological quality of all ten articles were assessed using a structured assessment tool. However, whilst all studies scored 'fair' or above; 50%, representing a mild or moderate risk of bias, assessment was only carried out by one reviewer and subsequently lacks a check of inter-rater reliability.

Finally, despite using a framework based on well-established and researched maladaptive behaviours within the homeless population (Kingston et al., 2011), it could be suggested that other pertinent behaviours have been overlooked in the review, e.g. gambling, criminal activity, and are in need of further investigation with regards to attachment.

### 1.4.4 Recommendations for Future Research.

Whilst a deliberately broad inclusion criteria was used for this review, only ten articles were deemed eligible for inclusion. This clearly highlights the lack of attention this research area currently attracts. It is suggested that homeless research

has traditionally focused on the societal ‘macro’ factors involved in homelessness and tenancy breakdown, i.e. housing and employment, with until recently the psychological elements involved in this process being largely overlooked. However, given the recognised importance of attachment styles and maladaptive behaviours in the development and maintenance of homelessness, this should not be ignored. Furthermore, given the apparent paucity a number of recommendations for future research are presented.

Firstly, the generalisability of this review is limited due to a particular focus on youth, veteran and American samples. Therefore future research should consider the full spectrum of homeless people within their research including different nationalities, genders and cultures. Furthermore, whilst two studies considered differences between homeless and housed populations these findings need to be expanded. Comparisons between specific homeless sub-populations, i.e. those living in hostels, on the street, ‘sofa-surfing’, would also be a useful area for development.

This review has also highlighted the need for more consistency amongst measures, particularly attachment, and recommends a move towards conceptualizing attachment using the widely supported continuous dimensions of avoidance and anxiety in future research. To address the acknowledged over-reliance on self-report measures, the use of objective measures of both attachment and maladaptive behaviours, namely behavioural and physiological measures, would also be valuable in future studies.

In addition, more studies focused on exploring the variables involved in the relationship between attachment and maladaptive behaviours, e.g., self-regulation,

childhood adversity and mental health problems, will be beneficial in developing the current understanding of how these two factors interact.

### 1.4.5 Implications

In line with theoretical understanding, this review has emphasised the role of attachment styles in the development of maladaptive behaviours within the homeless population. Furthermore, whilst research within this area is still in its infancy and in need of further exploration, the current review raises a number of clinical implications going forward.

This review has highlighted the high rates of insecure attachment within the homeless population. In the literature, insecure attachment has consistently been shown to influence an individual's engagement with support (Muller, Gragtmans & Baker, 2008), and as such an awareness of one's attachment style may be vital in optimising treatment engagement and outcomes for homeless individuals (Massey et al., 2014). For example, therapeutic interventions targeting an individual's maladaptive behaviours (e.g. Cognitive behavioural therapy (CBT) for addiction, Dialectical Behaviour Therapy; DBT) may need to attend more to individual relationships within therapy and tailor specific interventions to the attachment style the client presents with (Selwood, 2013).

In addition, in line with evidence of 'earned security' in individuals previously presenting with insecure attachment styles (Paley, Cox, Burchinal, & Payne, 1999), interventions specifically targeting attachment styles may be particularly important within this area of study. Suitable approaches may aim to address an individual's core views of themselves and others, whilst also working towards the development of a secure base in which the individual can explore

alternative experiences and challenge deeply-held beliefs (Bowlby, 1998; Gwadz, Clatts, Leonard, & Goldsamt, 2004). Subsequently, with a greater felt security an individual may be less likely to use maladaptive behaviours to regulate their emotion (Massey et al., 2014).

A number of therapeutic interventions focusing on attachment relationships, e.g. attachment-focused therapies (Bettman & Jasperson, 2007), already exist and whilst well validated in other settings are missing within homeless research. Therefore, applying these concepts to treatment within the current context is promising and warrants further investigation (Fletcher, Nutton, & Brend, 2015).

In terms of preventative work, early identification and support (i.e. skills development, attachment-focused work) for individuals likely to have developed insecure attachment styles may be useful in preventing the development of maladaptive coping strategies and subsequent homelessness. For example, a focus on gradual exposure to emotional expression and interpersonal effectiveness may be particularly pertinent for individuals experiencing attachment avoidance, whilst those experiencing attachment anxiety may benefit more from impulse regulation and reflective functioning skills training (Tasca et al., 2009; Selwood, 2013).

Finally, beyond interventions focused on the individual, support and adaptations aimed at an individual's living environment may also be advantageous. In the context of homelessness, this may mean that hostels and/or other relevant care environments work towards developing a 'psychologically informed environment' (PIE), whereby a service's approach and day to day running is centred on the psychological and emotional needs of their service users (Breedvelt, 2016). As such, environments may be adapted to consider the needs of an individual's attachment

system and focused on developing an individual's capacity to self-manage their problematic behaviours (Keats, Maguire, Johnson, & Cockersall, 2012).

### 1.4.6 Conclusions

This review has examined the existing empirical literature in order to explore the role of attachment in the development of maladaptive behaviours within the homeless population. It has highlighted the high rates of insecure attachment and maladaptive behaviours within this population. Furthermore, the results suggest a significant relationship between insecure attachment and maladaptive behaviours, namely substance abuse, aggression and suicidal ideation.

However, given the current paucity of papers within this field, it has also highlighted the need for further research in order to better understand this relationship and its involvement in the development and maintenance of homelessness.

# Chapter 2 Empirical Paper

## The relationship between Childhood Adversity, Attachment and Impulsivity within a Homeless Population.

## 2.1 Introduction

### 2.1.1 Homelessness

Homelessness continues to be a growing problem in the UK, with recent figures showing 78,930 households in temporary accommodation (Homeless Link, 2017) and 4,751 individuals sleeping rough in England on any given night in Autumn 2017, a figure up 15% from the previous year (MHCLG, 2018). However, despite these alarming statistics, true figures are likely to be significantly higher with a predicted 62% of homeless people falling into the category of 'hidden homeless', i.e. people living in unsuitable accommodation or 'sofa-surfing', and subsequently being missed from official figures (Reeve, 2011).

Yet homelessness goes far beyond not having a roof over one's head, with detrimental effects being seen on both a societal and individual level. On a societal level, homelessness is estimated to cost society one billion pounds a year, with higher rates of service use, namely medical, e.g. emergency services, mental health and criminal justice, being seen amongst homeless people compared to the housed population (Pleace, 2015). There is also a damning human cost, with homelessness being linked to increased suicide, mental health and substance abuse issues, and lower life expectancy, i.e. 42 years which is half the UK average (Warnes et al., 2003). In light of this, research focused on understanding the complex pathways leading to and maintaining homelessness continues to be of upmost importance.

### 2.1.2 Pathways to Homelessness

Homelessness is considered to be a complex, multifaceted problem (Anderson & Rayens, 2004) made up of individuals with differing needs, behaviours and priorities (Linn & Gelberg, 1989). However despite the heterogeneity within this population (Victor, 1997), a mix of both macro (i.e. societal issues; poverty, lack of affordable housing, lack of employment) and micro factors (i.e. individual factors; personal vulnerabilities, childhood experiences) are widely recognised in the development and maintenance of homelessness (Morrell-Bellai, Goering, & Boydell, 2000). Whilst, government policies have traditionally focused more on the macro implications, i.e. the practical and social needs of the homeless population continues to grow (DCLG, 2003). Therefore, to meet the needs of this vulnerable population, a better understanding of the processes at an individual level, i.e. micro level, is warranted.

### 2.1.3 Homelessness and Childhood Adversity

On a micro level, it is well documented that childhood adversity, including sexual, physical and emotional abuse, neglect and household dysfunction, e.g. domestic violence, substance abuse of a parent, parent in prison, is disproportionately high within homeless populations and comparable to other clinical groups (i.e. approximately twice that of the general public; Patterson, Moniruzzaman, & Somers, 2014; Maguire, Keats, & Sambrook, 2006). For example in a study by Keeshin and Campbell (2011), 84% of their homeless sample reported childhood physical or sexual abuse, whilst in another study 92% reported childhood emotional neglect (Bender et al., 2014).

Furthermore, it is suggested that adverse childhood experiences are likely to increase the risk of homelessness (Larkin & Park, 2012) and have consistently been linked to the mental health problems widely observed in this population, including depression (Bifulco, Moran, Baines, Bunn, & Standford, 2002), personality disorders (Bierer et al., 2003) and post-traumatic stress disorder (PTSD; Powers, Fani, Cross, Ressler, & Bradley, 2016). A link between childhood adversity and subsequent maladaptive behaviours has also been found, which include alcohol and substance misuse (Herrenkohl, Hong, Klika, Herrenkohl, & Russo, 2013), aggression, sexual promiscuity and suicidal behaviours (Banducci, Hoffman, Lejuez, & Koenen, 2014); all of which are prevalent within the homeless population (Goldstein, Luther, & Haas, 2012). Research has started to explore the underlying mechanisms linking childhood adversity and maladaptive behaviours (and the mental health difficulties associated with them), with impulsivity being identified as a potential mediating variable (Cicchetti, Rogosch, & Thibodeau, 2012; Bailey & McCloskey, 2005).

### 2.1.4 Impulsivity and Homelessness

Impulsivity, often used in conjunction with the terms ‘self-control’ and ‘self-regulation’ is considered a complex construct (Stanford, Mathias, Dougherty, Lake, Anderson, & Patton, 2009). However, it is popularly defined as a stable personality trait exemplified by a “predisposition toward rapid, unplanned reactions to internal or external stimuli without regard to the impulsive individuals or to others” (Moeller, Barratt, Dougherty, Schmitz, & Swann, 2001). Furthermore, impulsivity as a construct is widely measured using the Barratt Impulsiveness Scale (BIS; Barratt, 1985), which assesses an individual’s impulsiveness based on three subtraits, namely cognitive impulsiveness (i.e. quick decision making), motor impulsiveness (i.e.

doing without thinking) and non-planning impulsiveness (i.e. lack of thinking to the future or planning).

Numerous studies have independently linked impulsivity to both childhood abuse (e.g. Daray et al., 2016; Brodsky, Oquendo, Ellis, Haas, Malone, & Mann, 2001) and maladaptive behaviours, including substance abuse and sexual risk behaviours (Perry & Carroll, 2008; Hayaki, Anderson, & Stein, 2006). Moreover, impulsivity has been identified as a variable influencing the relationship between abuse and antisocial behaviours (Oshri, Sutton, Clay-Warner, & Miller, 2015), abuse and suicidality (Brodsky et al., 2001) and as a symptom of several disorders linked to childhood victimisation within DSM-5 (e.g. antisocial and borderline personality disorders; Veith, Russell, & King, 2017).

Within the homeless population, impulsivity difficulties have also been reported as a key factor in the problematic behaviours which lead to homelessness (Maddock, Hevey, & Eidenmueller, 2016; Freyberger, Ulrich, Barnow, & Steinhart, 2008) and as a mediating variable between childhood trauma and maladaptive behaviours (Dowling, 2014). However, the precise manner by which childhood adversity contributes to impulsive-like traits and subsequent maladaptive behaviours has yet to be studied in detail. Attachment theory offers a potentially useful framework for understanding this relationship.

### 2.1.5 Attachment theory

First introduced by Bowlby (1969), attachment theory maintains that early interactions with a caregiver play a pivotal role in shaping a child's expectations and beliefs of the world, themselves, and the availability and responsiveness of others (Gwadz et al., 2004), i.e. their internal working model (IWM; Bowlby, 1977). It

suggests that these early attachments also provide the infant with a base from which to watch, model and develop their own coping skills and self-regulation strategies (behavioural and emotional), for use during times of distress (Golder et al., 2005).

Furthermore, this theory proposes that the quality of such interactions determines an individual's attachment style: a relatively stable strategy an individual uses to form and maintain relationships throughout their lifetime (Ainsworth et al., 1978; Rutter, Kreppner, & Sonuga-Barke, 2009; Shaver & Mikulincer, 2005). Individuals who have experienced interactions with a responsive, consistent primary care-giver are thought to develop a secure attachment style (i.e. a positive internal working model of the self and others, and a sense that the world is a safe place). However, if a primary care-giver is inconsistent or unresponsive in times of need, negative internal working models of the self and others develop (i.e. a sense that the world is an unsafe place, an inability to trust and depend of on the care giver), leading to attachment insecurity (Bowlby, 1977).

Typically, attachment insecurity is further divided into insecure-anxious/ambivalent and insecure-avoidant subtypes (Ainsworth et al., 1978) depending on the specific patterns of behaviour a child exhibits during separations and times of distress. Specifically, an infant faced with an inconsistent caregiver will likely develop an insecure-anxious attachment style, characterised by a need for reassurance and fear of separation and abandonment. Whereas an infant faced with a rejecting care-giver will likely develop an insecure-avoidant attachment style, characterised by mistrust and discomfort with intimacy and an avoidance of the care-giver in times of distress.

Unsurprisingly, insecure attachment styles are commonly found in individuals who have experienced childhood abuse or neglect (Brassard, Darveau, Peloquin, Lussier, & Shaver, 2014) and have been associated with psychopathology and maladaptive behaviours in adults (Mikulincer & Shaver, 2012; Shorey & Snyder, 2006). Hence unsurprisingly, high levels of insecure attachment have also been identified within the homeless population (Dowling, 2014; Aliverdinia & Pridemore, 2012).

### 2.1.6 Attachment and Impulsivity

In light of attachment's theorised role in an individual's capacity to regulate behaviour and affect (Levy, 2005), preliminary associations between impulsivity difficulties and insecure attachment have also been established (Levy, Clarkin, Yeomans, Scott, Wasserman, & Kernberg, 2006). However, it is thought that these difficulties may differ between specific insecure attachment styles.

For instance, insecure anxious attachment is thought to be associated with high levels of impulsivity (Mikulincer & Shaver, 2007), i.e. in stress-related situations, these individuals default to hyper-activating strategies to cope, such as intense proximity seeking behaviours and exaggeration of threats (Mikulincer & Shaver, 2007). Whereas, insecure avoidant attachment is thought to be associated with extremely low levels of impulsivity (i.e. 'over controlled'; Fossati et al., 2005); which is considered equally as maladaptive (Letzring, Block, & Funder, 2005). In stress-related situations, these individuals instead default to de-activating strategies such as inhibition of emotional expressivity and withdrawal (Fossati et al., 2005).

However, despite a strong theoretical basis, there is a lack of empirical support for the relationship between attachment and impulsivity, particularly within

populations typified by high levels of childhood adversity and behavioural difficulties. Consequently, to understand the implications of this in relation to homelessness, further research is required.

### 2.1.7 Rationale for Current Study

The homeless are considered to be one of society's most isolated and vulnerable populations; associated with increased mental health and substance abuse issues and higher rates of suicide (Warnes et al., 2003). Consequently, in order to tackle this growing problem there is an on-going need for research focused on understanding the complex pathways leading to and maintaining homelessness.

Within the literature, both childhood adversity and impulsivity difficulties have been linked to increased risk of homelessness (Larkin & Park, 2012), and indirectly linked through their association with maladaptive behaviours (Maddock et al., 2016). However, the means by which childhood adversity contributes to the development of impulsive-like traits (and subsequent use of maladaptive coping strategies) is currently poorly understood. Furthermore, whilst attachment has been identified as a potential mediating factor in this relationship, this is yet to be established within the homeless population and needs to be further explored.

In addition, whilst a large body of research has examined attachment classifications in other socially excluded populations, e.g. offender population (Ogilvie, Newman, Todd, & Peck, 2014), there has been a limited amount of literature devoted to attachment within the homeless population. This is somewhat ironic given that Bowlby's attachment theory was developed through observations he made of homeless children lacking a strong maternal presence growing up (Bowlby, 1980; Dice, 2012).

Furthermore within the homeless population, the adult attachment research to date has largely focused on the three primary attachment styles, i.e. secure, insecure-anxious and insecure-avoidant (Ainsworth et al., 1978). However, disorganised attachment, labelled a third insecure category and characterised by an incoherent attachment strategy (Hocking, Simons, & Surette, 2016), has been highly correlated to externalising behaviours (e.g. aggression; Lecompte & Moss, 2014) and childhood maltreatment (Schimmenti & Bifulco, 2015; Cicchetti & Barnett, 1991). Consequently, whilst limited research currently exists, this attachment style may be particularly salient within the homeless population and needs further exploration.

Therefore the present study aimed to further investigate levels of insecure attachment (including disorganised attachment) within the homeless population and explore its association with the factors implicated in the development and maintenance of homelessness, namely childhood adversity and impulsivity. More specifically this study will test the following hypothesises:

1. Childhood adversity will positively predict insecure attachment, i.e. disorganised, anxious and avoidant.
2. Childhood adversity will positively predict levels of impulsivity.
3. (a) Anxious and disorganised attachment will positively predict levels of impulsivity whilst (b) avoidant attachment will negatively predict levels of impulsivity.
4. The relationship between childhood adversity and impulsivity will be mediated by insecure attachment styles.

## 2.2 Methodology

### 2.2.1 Design

This study used a within-subjects, cross-sectional correlational design utilising self-report questionnaires to measure childhood trauma, adult attachment style and impulsivity within homeless men and women.

### 2.2.2 Sample

**2.2.2.1 Sampling Strategy.** Participants were recruited using opportunity sampling from six homeless hostels, four situated in the city of Southampton, one in the city of Portsmouth and one from the greater London area. Recruitment took place over the winter of 2017-2018 and was completed in 16 visits, with an average of 1-3 visits per hostel.

**2.2.2.2 Justification of Sample Size.** To determine the required sample size to test hypotheses 1, 2 and 3, an a priori power analysis was conducted using G*Power, version 3.1 (Faul, ErdFelder, Lang, & Buchner, 2007). This indicated that a sample of 64 participants would be required to detect a medium effect size (*r*=.*30*), where power was .8 and $\alpha = .05$ when conducting correlational analysis. An additional four participants would be required for regression analysis, i.e. $n = 68$ (Cohen, 1992). Whilst there is a lack of research in this area, the effect size used in this power calculation was based on those reported in studies of a similar nature to the current paper, e.g. attachment in the homeless population (Selwood, 2013; Aliverdinia & Pridemore, 2012).

In addition, a bootstrap methodology was proposed to examine the indirect effects within a mediation analysis (hypothesis 4). Whilst it is suggested that a sample size of 71 is suitable to detect a medium effect size with .8 power when using

a bias corrected bootstrap method in mediation models, this type of analysis can often be underpowered (Fritz & Mackinnon, 2007). Therefore, as suggested by Fritz and Mackinnon (2007), an increase of 10% was added to the required sample size, i.e. $n = 79$.

**2.2.2.3 Exclusion/Inclusion Criteria.** Both male and female adults (aged 16 years and above) who were currently homeless[1] were deemed eligible to take part in the study. Individuals were only excluded if they were unable to understand written or spoken English, demonstrated an inability to recall childhood experiences and/or presented as under the influence of drugs/alcohol to an extent that would impair their ability to participate.

**2.2.2.4 Participant Demographics.** Ninety one participants were initially recruited for the study from an estimated pool of approximately two hundred (45.5%). Subsequently, eight participants were excluded from the statistical analysis due to a) not meeting the inclusion criteria ($n$=2), b) failing to fully complete the questionnaires[2] ($n$ = 3), c) providing unreliable/invalid responses[3] ($n$= 3); leaving a final total sample of 83 participants (91.2% of the recruited sample). Of this sample, mean age was 34.9 years (SD = 12.0. range = 17–54), 84.3% identified as White British, 59% were male and 91.6% were living in homeless hostels. Table 5 shows the full demographic characteristics of the final sample.

[1] Anyone without permanent accommodation, including homeless hostels, shelters, rough sleepers and any other form of temporary accommodation.
[2] Participants completed less than 50% of items.
[3] A succession of the same answer was given regardless of reversed items.

Table 5. *Demographic information of final sample (n =83)*

| Variable | Category | N | Frequency (%) |
|---|---|---|---|
| Age (years) | 17-25 | 24 | 28.9 |
| | 26-35 | 18 | 21.7 |
| | 36-45 | 18 | 21.7 |
| | 46-55 | 23 | 27.7 |
| Gender | Male | 49 | 59 |
| | Female | 34 | 41 |
| Ethnicity | White British | 70 | 84.3 |
| | White Irish | 1 | 1.2 |
| | White Other | 2 | 2.4 |
| | Black African | 2 | 2.4 |
| | Black Caribbean | 2 | 2.4 |
| | Black Other | 1 | 1.2 |
| | White and Black Caribbean | 2 | 2.4 |
| | White and Asian | 1 | 1.2 |
| | White and Black Other | 2 | 2.4 |
| Accommodation Status | Living on the streets | 3 | 3.6 |
| | Homeless Hostel | 76 | 91.6 |
| | Sofa Surfing | 1 | 1.2 |
| | Overcrowded Housing | 1 | 1.2 |
| | Other | 2 | 2.4 |
| Number of episodes of homelessness*[4] | 1 | 34 | 41 |
| | 2-3 | 21 | 25.3 |
| | 4-5 | 13 | 15.7 |
| | 6-7 | 4 | 4.8 |
| | >10 | 9 | 10.8 |
| Length of current episode of homelessness* | <1 month | 2 | 2.4 |
| | 1-6 months | 21 | 25.9 |
| | 7-12 months | 14 | 17.3 |
| | 1-5 years | 37 | 45.7 |
| | >5 years | 9 | 11.1 |
| Age when first homeless (Years)* | <18 | 33 | 40.7 |
| | 19-25 | 11 | 13.6 |
| | 26-35 | 16 | 19.8 |
| | 36-49 | 18 | 22.2 |
| | >50 | 3 | 3.7 |

Note * = Items missing full participant demographic information (*n*= 2).

[4] Number of episodes of homelessness = the number of times an individual has moved from permanent accommodation to being homeless. Therefore, one episode of homelessness can range from <1 month to >5 years if the individual has not secured permanent accommodation in this time.

### 2.2.3 Materials

#### 2.2.3.1 Demographic Information

Participants were asked to complete a demographic questionnaire which included questions about gender, age, ethnicity, and housing status (see Appendix B1 for details).

#### 2.2.3.2 Childhood Adversity

*Adverse Childhood Experiences Questionnaire* (*ACE;* Dube, Felitti, Dong, Chapman, Giles, & Anda, 2003; Felitti et al., 1998; Appendix B2). The ACE is a self-report questionnaire made up of ten discrete binary items (no/yes) used to retrospectively assess participant's experience of childhood abuse (i.e. emotional, physical and sexual), neglect (i.e. physical and emotional) and household dysfunction (i.e. domestic violence, parental separation/divorce, mental illness, substance abuse and incarcerated household member). Participants were asked to respond with either 'yes' or 'no' to the ten items, with a total score ranging from 0 (i.e. no exposure to the ten categories of child abuse/trauma) to 10 (i.e. exposure to all ten categories) being given. Based on previous research demonstrating the differing psychological effects of childhood abuse, neglect and household dysfunction on an individual (Wright, Crawford &, Del Castillo, 2009; Thomson & Jaque, 2017), the study used both the total ACE score and individual ACE items within analysis. The ACE has demonstrated excellent test-retest reliability (Dube et al., 2003) and high levels of internal consistency ($\alpha = .88$; Murphy et al., 2014).

#### 2.2.3.3 Adult Attachment

*The Experiences in Close Relationships – Revised (ECR-R;* Fraley, Waller, & Brennan, 2000; Appendix B3*).* This 36-item self-report measure was used to assess

adult attachment patterns along two dimensions: anxiety (i.e. fear of abandonment; 18 items) and avoidance (i.e. discomfort with dependence and closeness; 18 items). Participants were asked to respond on a 7-point Likert scale ranging from 1 (*disagree strongly*) to 7 (*agree strongly*), rating the extent to which each item describes their feelings in close relationships, with higher dimensional scores indicating greater levels of either avoidant or anxious attachment. Total mean scores taken from both the anxiety and avoidance dimensions were used in this research. The ECR-R has demonstrated strong internal consistency (α =.92; Hocking et al., 2016), test-retest reliability (Sibley & Liu, 2004) and has been successfully used within both clinical and non-clinical settings (Ravitz, Maunder, Hunter, Sthankiya, & Lancee, 2010).

*Adult Disorganised Attachment Scale (ADA*; Paetzold, Rholes, & Kohn, 2015; Appendix B4). This 9-item self-report measure was used to assess the degree of disorganised attachment. Participants were asked to respond on a 7-point scale ranging from 1 (*strongly agree*) to 7 (*strongly disagree*), rating the extent to which each item describes their feelings in close relationships with higher total scores indicating more disorganisation. Whilst the original scale was aimed at romantic relationships, this was changed to 'close other' following permission from the author. This was considered more appropriate for the sample population. A total mean ADA score was used in this study. The ADA has demonstrated strong internal consistency (α =.91; Rholes, Paetzold, & Kohn, 2016).

#### 2.2.3.4 Impulsivity

*The Barratt Impulsiveness Scale (BIS-11*; Patton, Stanford, & Barratt, 1995; Appendix B5). This 30-item self-report measure was used to assess trait impulsivity

across three main components: *Motor Impulsiveness* (i.e. acting without thinking), *Non-planning Impulsiveness* (i.e. a lack of future thinking or forethought) and *Attentional Impulsiveness* (i.e. inability to focus attention or concentrate; Barratt, 1985). Participants were asked to respond on a 4-point scale ranging from 1 (*Rarely/Never*) to 4 (*Almost always/Always*), with higher total scores indicating higher levels of impulsiveness. The total BIS score and the three subscale scores were used in this study. The BIS is thought to be the most commonly administered self-report measure of impulsiveness currently available and has repeatedly demonstrated good reliability (e.g., Cronbach's $\alpha$ = .82; Bender et al., 2011) across a variety of research and clinical settings (Patton, et al., 1995).

### 2.2.4 Procedure

#### 2.2.4.1 Approach

Service managers of prospective homeless hostels were initially approached to discuss the planned research and gain consent to approach service users. On agreement, each hostel was then provided with posters and information sheets, including the planned data collection dates/times; in order to advertise the study to residents (See Appendix B6 – B7). The posters were displayed in suitable locations within the hostels to promote uptake, with information sheets on the nature of the study together with the amount of monetary compensation being offered (i.e. a £6 'love to shop' voucher) being further provided at the reception desk of each hostel.

#### 2.2.4.2 Recruitment

Recruitment and data collection was conducted in partnership with another researcher, whose research also incorporated the ACE measure (Dube et al., 2003)[5]. A flexible 'drop-in' format to data collection, facilitated by the researchers, was adopted at the hostels in order to maximise recruitment, with all potential participants being given a verbal overview of the study and time to ask any questions. Interested participants were then given written information and consent forms, including clear explanations around confidentiality, anonymity, risk and right to withdraw, and if satisfied, asked to provide written consent. At this point, participants were each given a unique identification number to maintain anonymity and depending on personal preference and literacy levels, were either assessed privately or with other service users (maximum being four participants at any one time).

Participants were then given a questionnaire pack to complete containing all self-report measures[6]. Whilst the questionnaires within the pack were randomised to reduce response bias, the ACE was placed towards the middle of the pack due to the potentially distressing nature of the questions. On completion, participants were provided with a mood-repair task, i.e. a series of jokes participants were asked to rate, followed by both a verbal and written debrief, information on additional support

[5] The co-researcher was a trainee clinical psychologist also investigating adverse childhood experiences within the homeless population. The research design, questions, and hypotheses, data analysis and interpretation of results were conducted independently.

[6] Questionnaire packs contained the four self-report measures outlined in the present study together with an additional two from the co-researchers study. An additional computer task used to measure facial recognition was also included for the co-researchers benefit.

services and a £6 voucher as compensation for their time. In total the process lasted around 40 minutes.

#### 2.2.4.3 Ethical considerations

This research project gained full ethical approval from the University of Southampton's Ethics and Research Governance Committee (ERGO; See Appendix B8) and was designed in adherence with the guidelines laid down by this university and the British Psychological Society (BPS).

In addition, due to the nature of some of the questionnaires and the vulnerability of the participants, strategies were implemented to reduce possible distress. Beyond the implementation of the mood repair task and a thorough information giving/debrief process, pre and post-task distress was assessed using a visual analogue scale ranging from 0 (not distressed) to 10 (very distressed). The researcher(s) also remained vigilant to any signs of distress throughout the data collection with any concerns being followed up by the researcher(s) and/or hostel staff[7]. Furthermore, a clinical psychologist supervising the study and experienced with working within the homeless population was available for consultation/support, if necessary[8].

#### 2.2.4.4 Statistical Analyses

The data was coded and analysed using Statistical Packages for Social Sciences V24 (SPSS; IBM, 2016). Preliminary analysis was then conducted to establish descriptive statistics and assess suitability for further parametric analysis. In line with the study's hypotheses (i.e. hypothesis 1, 2 and 3) relationships between

[7] This occurred twice.
[8] This was not required.

variables were assessed using correlational analysis, with any variables that correlated significantly being further investigated using regression analysis, i.e. to assess the strength of the relationship and determine both independent and combined effects. Furthermore, based on these findings and to examine any indirect effects a mediation analysis using a bootstrapping method was planned (hypothesis 4).

## 2.3 Results

### 2.3.1 Preliminary Analysis

Preliminary analyses were conducted on the final sample ($N$ = 83) to check the distribution of the data and identify any outliers. Visual inspection of histograms together with skewness and kurtosis z-scores were used to assess the assumption of normality, with normal distribution being found for total scores on all measures (i.e. both skewness and kurtosis z-scores = $z < 1.96$; Field, 2013). A small number of outliers were identified using boxplots ($n$ = 5). However, these were considered extreme cases within the sample population. Furthermore, due to their value being less than 3 *SD* from the mean (Howell, 1998) they were not deemed problematic and consequently not removed from the data set or transformed.

An increased chance of incurring a type I error (i.e. incorrectly finding a significant effect) was acknowledged given the number of variables studied. However, given previous research demonstrating the differing effects of impulsivity (Minzenberg, Poole, & Vinogradov, 2006) and childhood maltreatment subtypes (Oshri et al., 2015), analysing the subscales on both these measures was deemed essential. The use of a Bonferroni Correlation was considered, however as this approach is often deemed overly conservative and can increase the chances of finding false negative results (type II error), it was not performed (Wood, 2002).

### 2.3.2 Descriptive Statistics

Table 6 shows the mean scores and standard deviations for the ACE total, BIS-11, ECR-R and ADA measures. Internal consistency was also computed for all variables using Cronbach's alpha scores, and have been included in the table. All measures were found to have adequate reliability ($\alpha > .70$), with the exception of the

BIS-11 subscales[9] (all α >.60). It is recommended that results from these subscales are interpreted with caution.

Table 6. *Means (SD) and Cronbach's alphas for Variables and Subscales.*

| Variable | Subscale | α | M (*SD*) |
|---|---|---|---|
| Adverse Childhood Experiences Questionnaire (ACE) Total | - | .72 | 4.96 (2.56) |
| Experiences in Close Relationships-Revised (ECR-R) | Anxiety | .88 | 3.97 (1.18) |
| | Avoidance | .82 | 3.90 (0.99) |
| Adult Disorganised Attachment Scale (ADA) | - | .84 | 3.55 (1.35) |
| The Barratt Impulsiveness Scale (BIS-11) | Motor Impulsiveness | .68 | 27.35 (5.38) |
| | Non-planning Impulsiveness | .63 | 29.60 (5.23) |
| | Attentional Impulsiveness | .62 | 20.43 (4.03) |
| | Total BIS | .79 | 77.39 (11.41) |

#### 2.3.2.1 Childhood Adversity

Participant's total ACE score (*M* = 4.96, *SD* = 2.56) were consistent with previous research within the homeless population (Larkin & Park, 2012) and comparable to other clinical populations. e.g., individuals with psychosis (*M* = 4.33, *SD* = 2.17; Vallejo, Cesoni, Farinola, & Prokopez, 2017). This is also considerably higher than those reported in the non-clinical population (*M* = 2.89, *SD* = 2.18; Thomson & Jaque, 2017), with total ACE score ≥ 4 = 68.67% of participants in the present study compared to 29.10% (Thomson & Jaque, 2017).

[9] Whilst the option of removing items to increase internal consistency was explored, no significant improvements were achieved. Furthermore, as changing the measure's content reduced comparability between studies, no changes were made.

With regards to individual ACE items, all prevalence rates (outlined in table 7) were found to be comparative to those in previous homeless research (Larkin & Park, 2012) and significantly higher than those reported in the non-clinical population (Thomson & Jaque, 2017). Emotional abuse was reported most often (69.9% of participants compared to 43.3%), followed by physical abuse (66.3% vs. 31.5%). Parental separation/divorce was the highest reported household dysfunction item (65.1% vs. 37.8%).

In addition, significant gender differences were found for the ACE total, $t(67.59) = 2.413$, $p = .019$, and the individual items of 'emotional neglect', $t(81) = 2.365$, $p = .020$ and 'household member with mental health problems', $t(81) = 4.42$, $p = .001$, suggesting that homeless women experienced a significantly higher number of adverse childhood experiences in these areas. No gender differences were found on any of the other scales.

Table 7. *Prevalence of individual ACE items.*

| **Category** | ***N*** | **Prevalence %** |
|---|---|---|
| Abuse – Emotional | 58 | 69.9 |
| Abuse – Physical | 55 | 66.3 |
| Abuse – Sexual | 23 | 27.7 |
| Neglect – Emotional | 46 | 55.4 |
| Neglect – Physical | 29 | 34.9 |
| Household Dysfunction- Parental separation/Divorce | 54 | 65.1 |
| Household Dysfunction -Domestic violence towards Mother | 30 | 36.1 |
| Household Dysfunction -Household Member with Substance Abuse Problems | 47 | 56.6 |
| Household Dysfunction - Household Member with Mental Health Problems | 44 | 53.0 |
| Household Dysfunction -Household Member Imprisoned | 29 | 34.9 |

#### 2.3.2.2 Attachment

*ECR-R***:** In line with previous research (Keohane, 2014, Selwood, 2013), high levels of anxious (*M* = 3.97, *SD* = 1.18) and avoidant (*M* = 3.90, *SD* = 0.99) attachment were found in this population. Both scores were comparative to those found within a clinical sample, i.e. anxious (*M* = 3.60, *SD* = 1.18) and avoidant (*M* = 4.04 *SD* = 1.39; Mackintosh, Power, Schwannauer, & Chan., 2017) and higher than in a non-clinical comparison, i.e. anxious (*M* = 1.95, *SD* = 0.82) and avoidant (*M* = 2.66, *SD* = 0.98) (Arikan, Stopa, Carnelley, & Karl, 2016).

*ADA*: Participants' overall disorganised attachment scores was found to be significantly higher (p <.001; *M* = 3.55, *SD* = 1.35) than the reported average for a non-clinical sample (*M* = 2.31, *SD* = 1.24; Rholes, Paetzold, & Kohn, 2016). No significant gender differences were found on either attachment measures.

#### 2.3.2.3 Impulsivity

Participants overall impulsivity scores were found to be higher (*M* = 77.39, *SD* = 11.41) than the reported average for a non-clinical sample (*M* = 62.8, *SD* = 9.2; Stanford et al., 2009), but comparable to other clinical samples, e.g. depressed individuals (*M* = 74.5, *SD* = 11.7; Peluso et al., 2007). This was also true for all the BIS subscales, with non-planning having the highest mean score (*M* = 29.60, *SD* = 5.23). Consistent with Stanford et al. (2009) and Patton et al. (1995), no significant gender differences were found for the BIS-11 or any of its subscales.

### 2.3.3 Correlational and Regression Analyses

In order to test hypotheses 1, 2 and 3, Pearson correlation coefficients were calculated to assess the degree of association between variables. In order to account for significant differences in gender, partial correlations were conducted for those

involving the variable 'ACE total', and subscales 'emotional neglect' and 'household member with mental health problems. Table 8 presents correlations between total ACE, attachment (anxious, avoidant and disorganised) and total BIS scores. Additional correlations assessing associations between subscales can be found in Appendix B9.

Table 8. *Pearson's bivariate or partial correlations (for correlations controlled for gender) between total childhood adversity, attachment and impulsivity.*

| Variable | ACE Total | ECR-R Anxious | ECR- R Avoidant | ADA | BIS Total |
|---|---|---|---|---|---|
| ACE Total | | | | | |
| ECR-R - Anxious | .25**[a] | | | . | |
| ECR-R Avoidant | .22*[a] | .20 | | | |
| ADA | .41***[a] | 42*** | .21 | | |
| BIS Total | -.04 | .02 | -.20 | .11 | |

*Note:* ACE = Adverse Childhood Experiences Questionnaire, ECR-R = Experiences in Close Relationships – Revised, ADA = Adult Disorganised Attachment Scale, BIS = Barratt Impulsiveness Scale. [a] = Partial correlation controlling for gender. *$p$ <.05, **$p$ < .01, ***$p$ <.001.

### 2.3.3.1 Hypothesis 1: Adverse Childhood Experiences and Attachment

As predicted, high levels of adverse childhood experiences were associated with greater levels of anxious, avoidant and disorganised attachment, as demonstrated by significant positive correlations between total ACE score and anxious ($r_{partial}(80) = .253$, $p = .022$) avoidant, ($r_{partial}(80) = .220$, $p = .047$), and disorganised attachment, ($r_{partial}(80) = .410$, $p < .001$). Furthermore, as ACE total demonstrated significant correlations with all three outcome variables, simple linear

regressions were conducted to see each relationships' relative strength (see table 9 for results).

Table 9. *Simple Linear Regressions between Total ACE score and the three Attachment Styles.*

| Predictor | Outcome | *B* | SE *B* | *β* | $R^2$ |
|---|---|---|---|---|---|
| Total ACE[a] | ECR-R Anxious | .12* [0.02, 0.22) | .05 | .26 | .11 |
| | ECR-R Avoidant | .09 [0.01, 0.18] | .04 | .23 | .05 |
| | ADA | .22*** [0.11, 0.34] | .06 | .43 | .17 |

*Note:* ACE = Adverse Childhood Experiences Questionnaire, ECR-R = Experiences in Close Relationships – Revised, ADA = Adult Disorganised Attachment Scale, $R^2$ is the amount of variance accounted for by predictors. [a] = controlled for gender.
*$p$ <.05, **$p$ < .01, ***$p$ <.001. 95% CI is reported in brackets.

Results indicated that ACE total could statistically significantly predict levels of anxious, $F(2, 80) = 4.75$, $p$ <.05, and disorganised attachment, $F(2, 80) = 8.23$, $p$ <.001, and ACE total accounted for 11% and 17% of the explained variability in these two attachment styles, respectively. However, this was not true for avoidant attachment, $F(2, 80) = 2.16$, $p$ =.12.

**2.3.3.2 Adverse Childhood Experiences and Attachment - Subscales**

Significant positive correlations were also found between individual ACE items and attachment styles (See Appendix B9), namely anxious attachment and physical abuse, $r_{pb}$ (81) = .223, p =0.43, emotional neglect, $r_{\text{partial}}$ (80) = .286, p = .009, and physical neglect, $r_{pb}$ (81) = .314, p =.004. Avoidant attachment and emotional abuse, $r_{pb}$ (81) = .218, p =.048, physical abuse, $r_{pb}$ (81) = .224, p=.042, emotional neglect, $r_{\text{partial}}$ (80) = .245, p = .027, and disorganised attachment and

emotional abuse, $r_{pb}$ (81) =.409, p <.001, physical abuse, $r_{pb}$ (81) = .255, p=.020, sexual abuse, $r_{pb}$ (81) = .352, p=.001, emotional neglect, $r_{\text{partial}}$ (80) = .293 p = .008, physical neglect, $r_{pb}$ (81) = .358, p=.001, and household member with substance abuse problems, $r_{pb}$ (81) = .297, p=.006.

In light of these findings, multiple regression analyses were performed to assess the relative independent and combined contribution of specific ACE items on attachment, namely anxious, avoidant and disorganised. Only ACE items with a significant bivariate correlation with the attachment styles were entered into the differing models. Due to the inclusion of the ACE item 'emotional neglect' within these analyses, gender was added to each regression as a covariate (see table 10 for results). In terms of assumptions, there was no evidence of multicollinearity, as assessed by tolerance values greater than 0.1, nor homoscedasticity, as assessed by visually inspecting plots of standardised predicted values versus unstandardized residuals (Field, 2013).

Results indicated that the overall regression model for both anxious attachment, $F(4, 78) = 3.99$, $p = .005$, and disorganised attachment, $F(7, 75) = 3.54$, $p = .002$, were statistically significant, and accounted for 17% and 25% of the overall variance in these two attachment styles, respectively; both of which are higher percentages than when only total ACE scores were considered (See table 9). Furthermore, in terms of independent predictors, in the disorganised attachment model, sexual abuse was a significant independent predictor ($\beta = .23$, $p = .049$) and emotional neglect was marginally significant ($\beta = .23$, $p = .067$) but emotional abuse ($\beta$ =.-.06, $p = .66$), physical abuse ($\beta = .08$, $p = .53$) and neglect ($\beta = .14$, $p = .25$)

were not. However, no significant independent predictors were found for anxious attachment.

Conversely, the regression model for avoidant attachment was not significant $F(4, 78) = 1.94$, $p = .11$ and nor were any of the independent predictors, i.e. all $p > .05$, indicating that this model and its predictors were not significant indicators of avoidant attachment.

Table 10. *Summary of Multiple Regression Results after Controlling for Gender.*

| **Outcome** | **Predictor** | ***B*** | ***SE*$^{B}$** | ***β*** | ***P.*** |
|---|---|---|---|---|---|
| ECR-R Anxious ($R^2$ = .17) | Constant | 3.61 [3.03, 4.19] | .29 | | *P* = .005 |
| | ACE - Physical Abuse | .23 [-0.33, 0.78] | .28 | .09 | |
| | ACE - Emotional neglect | .42 [-0.14, 0.99] | .28 | .18 | |
| | ACE - Physical neglect | .49 [-0.08, 1.06] | .28 | .20 | |
| ECR-R Avoidant ($R^2$ =.09) | Constant | 3.28 [2.76, 3.81] | .26 | | *P* = .112 |
| | ACE – Emotional Abuse | .17 [-0.46, 0.79] | .31 | .08 | |
| | ACE – Physical Abuse | .25 [-0.33, 0.84] | .29 | .12 | |
| | ACE - Emotional Neglect | .35 [-0.13, 0.83] | .24 | .18 | |
| ADA ($R^2$ =.25) | Constant | 2.49 [1.78, 3.20] | .36 | | *P* = .002 |
| | ACE – Emotional Abuse | .18 [-0.99, 0.63] | .41 | .06 | |
| | ACE – Physical Abuse | .24 [-0.52, 0.99] | .38 | .08 | |
| | ACE –Sexual Abuse | .68* [0.02, 1.36] | .34 | .23 | |
| | ACE - Emotional Neglect | .61 [-0.04, 1.27] | .33 | .23 | |
| | ACE - Physical neglect | .40 [-0.28, 1.08] | .34 | .14 | |
| | ACE -Household Member with SA Problems | .43 [-0.20, 1.06) | .32 | .16 | |

*Note:* ACE = Adverse Childhood Experiences Questionnaire, ECR-R = Experiences in Close Relationships – Revised, ADA = Adult Disorganised Attachment Scale, $R^2$ is the amount of variance accounted for by predictors, SA = substance Abuse. *$p$ <.05, 95% CI is reported in brackets

#### 2.3.3.3 Hypothesis 2: Adverse Childhood Experiences and Impulsivity

No significant correlations were found between total ACE and total impulsivity, $r_{partial}$ (80) = -.037, p = .742, or between any of the subscales on either measures, all p >.05.

#### 2.3.3.4 Hypothesis 3a and b: Attachment and Impulsivity

No significant correlations were found between total impulsivity and any of the attachment dimensions namely, anxious, $r$(81) = .017, p =.88, avoidant, $r$(81) = -.203, p =.07, or disorganised, $r$(81) = .114, p =.31. However, in line with hypothesis 3b, a significant negative correlation was found between the impulsivity subscale- non planning and avoidant attachment, $r$(81) = -.250, p = .023. This negative correlation suggested that greater levels of avoidant attachment is associated with lower levels of impulsivity related to future thinking or forethought. Furthermore, avoidant attachment was found to significantly predict levels of impulsivity- non planning, $F$(1, 82) = 5.391, $p$ <.05, and accounted for 6% of the variability.

### 2.3.4 Mediation analysis

Contrary to expectations, non-significant correlations were found between impulsivity and adverse childhood experiences and impulsivity and attachment, as seen above. Therefore, this data did not fit the criteria necessarily to test the hypothesised mediation model (i.e. Hypothesis 4). Consequently, at this stage no further analysis was completed.

## 2.4 Discussion

Whilst high rates of childhood adversity, insecure attachment and impulsivity are consistently found within the homeless population, the exact manner by which these factors interact and are involved in the development and maintenance of homelessness remains largely unclear. Therefore, the present study sought to add to the current literature base by exploring these factors in more detail. More specifically, the study aimed to further investigate levels of insecure attachment (including disorganised attachment), childhood adversity and impulsivity within the homeless population and explore the relationships between all three elements. Furthermore, based on sound theoretical principles, the study aimed to establish whether attachment played a significant role in mediating the relationship between childhood adversity and impulsivity in this population; an area of research as far as the author is aware has not been examined before.

### 2.4.1 Main Findings

As anticipated, high levels of childhood adversity, insecure attachment and impulsivity were found in the present sample. This is comparative to levels found in clinical populations (e.g., Mackintosh et al., 2017) and previous homeless research (e.g., Larkin & Park, 2012), and as expected are higher than those found within the general population (e.g., Thomson & Jaque, 2017; Arikan et al., 2016). Furthermore, in line with previous homeless research, physical and emotional abuse were the most frequently reported forms of childhood adversity (Selwood, 2013), whilst levels of insecure-anxious attachment were found to be slightly higher than insecure-avoidant (Keohane, 2014) and disorganised attachment styles.

In support of the first hypothesis, high levels of childhood adversity were found to be associated with insecure attachment, namely anxious, avoidant and disorganised. However, further regression analyses found childhood adversity to be a significant predictor for insecure-anxious and disorganised attachment scores only. These significant findings are consistent with attachment theory and numerous studies which have emphasised the link between difficult childhood experiences, i.e. those lacking consistent, validating and containing care-giving, and the development of insecure attachment styles (Bowlby, 1969; Brassard et al., 2014; Stronach et al., 2011).

In addition, differing associations were found between types of childhood adversity and insecure attachment dimensions. For example, physical abuse and emotional neglect were both found to be significantly associated with all three attachment styles, whilst 'household member with substance abuse problems' was the only household dysfunction item to be associated with insecure attachment, namely, disorganised. The lack of associations with household dysfunction is surprising given that wealth of literature highlighting the negative effect of such environments on childhood attachments, e.g. Household domestic violence (Zeanah et al., 1999) and household member with mental health problems (Murray et al., 1996). However, the lack of clarity around the relationship of the household member to the participant and the severity of such issues may in some way explain these findings.

Subsequent regression analyses revealed that when combined, physical abuse, emotional neglect and physical neglect significantly predicted anxious attachment scores. Whereas, emotional abuse, physical abuse, sexual abuse,

emotional neglect, physical neglect and household member with substance abuse problems, significantly predicted disorganised attachment scores. Sexual abuse was also found to be a significant independent predictor of disorganised attachment, suggesting that this factor alone made a significant contribution to the variance in disorganised attachment scores. These findings support previous research which has found disorganised attachment to be associated with the most extreme forms of childhood abuse and neglect (Erozkan, 2016; Widom, Czaja, Kozakowski, & Chauhan, 2018), e.g. sexual abuse, which results in a child being faced with the dilemma of needing but also being afraid of their attachment figure (Erozkan, 2016).

In addition, both these regression models accounted for a higher overall degree of variance in the two attachment style scores than total childhood adversity alone. This suggests that specific types of childhood adversity may play a more significant role in the development of insecure attachment than the total number of different experiences a child encounters.

Furthermore, whilst a number of our results are in line with previous findings, suggesting that outcomes vary by type of maltreatment, e.g. significant associations between childhood neglect and anxious attachment and sexual abuse and disorganised attachment (Oshri et al., 2015; Finzi, Ram, Har-Even, Shnit & Weizman, 2001; Riggs et al., 2007), mixed findings currently exist in the literature. Therefore, there is a continued need to examine the relationships between different types of child maltreatment and attachment styles before a consensus can be met (English, Bangdiwala & Runyan, 2005).

Similar to earlier results, the regression model for avoidant attachment was not found to be significant. Theoretically, these findings may in some way be explained

by the behavioural characteristics of the attachment style in question. More specifically, individuals with an avoidant attachment are thought to use deactivating strategies when faced with stress-related situations, including denial of emotion-related thoughts, feelings and information (Mikulincer & Shaver, 2007, 2008; Fossati et al., 2005). Consequently, some individuals may not have accurately recalled maltreatment or attachment-related information when asked.

In support of hypothesis 3b, insecure-avoidant attachment was found to negatively predict non-planning impulsivity, i.e. individuals with avoidant attachment had a tendency to be more 'over controlled' with regards to future-orientated cognitive processes (Fossati et al., 2005). Whilst this finding appears to theoretically fit with the attachment framework, contradictory evidence has been found in the literature, i.e. avoidant attachment has been found to be associated with increased non-planning impulsivity (Minzenberg et al., 2006). Therefore, further research is needed to examine the relationship between avoidant attachment and impulsivity in more detail.

However, contrary to expectations and despite a strong theoretical and empirical foundation no significant relationships were observed between childhood adversity and impulsivity or insecure-anxious or disorganised attachment and impulsivity. Whilst this may challenge the current theoretical understanding in this area and truly reflect a lack of association between these factors, there are a number of alternative explanations that may clarify these unexpected findings. Firstly, whilst the Barratt Impulsiveness Scale (BIS; Barratt, 1985) used in the present study is often considered to be the 'gold standard' measure for impulsivity (Reise, Moore, Sabb, Brown, & London, 2013), it fails to address the role of affect, particularly

negative affect on impulsivity (Anestis, Selby, & Joiner, 2007). Although not everybody feels compelled to act impulsively in order to alleviate negative emotions (Reise et al., 2013), this may be of particular relevance to the present study, considering the sample population and the factors investigated, e.g. attachment styles which have strong theoretical links to emotion regulation (Levy, 2005).

Furthermore, whilst the BIS has been successfully administered in the homeless population in the past (Dowling, 2014), the relevance of certain items to this population is questionable, for example, 'I plan for job security', 'I am restless during lectures/talks'. Therefore, the measure may not have asked the right questions to fully capture the true level of impulsivity within the present sample.

In addition, the internal consistency of all the BIS subscales were below the recommended Cronbach's Alpha level[10]; further questioning the reliability and validity of this measure for this population.

Beyond measurement issues, individual level factors may also provide some explanation for these unexpected results. For example, personality characteristics, e.g., resilience, or alternative positive childhood experiences may have served as buffers between the adverse childhood experiences/insecure attachments participants reported and impulsivity. Support for the presence of adaptive flexibility in this population has been documented by Willoughby (2010) who identified resiliency as a moderating factor in the relationship between childhood trauma and unhelpful coping behaviours. Consequently, research considering the effect of potential buffers in this area of study is clearly warranted and needs to be further explored.

[10] Recommended at .7.

### 2.4.2 Contributions and Clinical Implications

This paper makes significant contributions to the growing literature on homelessness and highlights a number of important clinical implications. It provides further support for the high rates of childhood adversity and insecure attachments within this population and emphasises the potential role childhood adversity plays in the development of these attachment styles. To the best of the author's knowledge, it is also the first homeless study to utilise an adult measure of disorganised attachment. In addition, despite mixed findings, this research is one of few studies to consider the role of impulsivity within the homeless population in the UK and how this may relate to both adverse childhood experiences and insecure attachment.

Within the literature, insecure attachment styles have repeatedly been shown to impact an individual's engagement in support (Muller et al., 2008), their adherence to individual and group therapy (Llardi & Kaslow, 2009), and the formation of therapeutic relationships (Smith, Msetfi, & Golding, 2010). Therefore, given the high prevalence of insecure attachment styles within the present sample this may be an important consideration when developing and delivering therapeutic interventions for homeless individuals in the future (Massey et al., 2014).

Accordingly, therapies looking to target the early traumatic experiences observed in a high proportion of this homeless sample (Trauma focused CBT, Narrative Exposure Therapy; NET) may need to assess and consider the attachment styles of the individual client and tailor the therapy as a result, e.g. more of a focus on the therapist - client relationship and consideration of the attachment strategies one may use to cope with emotionally salient information (Selwood, 2013). From this study's findings this may be especially important for those presenting with

avoidant attachment styles who are likely to minimise or deny emotion-related thoughts and feelings (Mikulincer & Shaver, 2007, 2008; Fossati et al., 2005).

Whilst attachment styles are considered to be relatively stable across the lifespan (Ainsworth, et al., 1978) it is suggested that individuals can 'overcome' attachment difficulties; a concept known as 'earned-secure' attachment (Hocking, Simons, & Surette, 2016). Consequently, interventions explicitly focused on developing secure attachment may be particularly valuable within the homeless population. Therapies focused on developing a secure base from which an individual can challenge deep-rooted beliefs, are already in existence, namely, Emotion Focused Therapy (Moser et al., 2015) and Mentalization-Based Therapy (MBT, Bateman & Fonagy, 2004). However, the utility of such therapies within the sample population is in need of further investigation (Fletcher et al., 2015).

Given the high levels of impulsivity found in the present study and the research linking this to maladaptive behaviours (Perry & Carroll, 2008), interventions focused on self-control may also be advantageous, e.g. Dialectical Behavioural Therapy (DBT; Linehan, 1993), aimed at teaching emotion regulation and self-management skills. Furthermore, in light of this paper's findings, Radically Open-Dialectical Behavioural Therapy (RO-DBT; Lynch, 2018), developed with the aim of helping individuals with severely over-controlled tendencies, may be particularly suited to individuals with insecure- avoidant attachment styles. However, both need further exploration within the homeless population.

Given the high rates of childhood adversity and insecure attachments within the homeless sample, this research also highlights the importance of early intervention and preventative work for those at risk of homelessness. For example,

family focused treatment approaches such as Dyadic Developmental Psychotherapy (DDP; Becker-Weidman & Hughes, 2008), i.e. an evidence based therapy for children who have experienced trauma and attachment difficulties, may be particularly useful. In DDP, therapy is aimed at developing a child's emotional regulation skills, self-awareness and secure relationships (Becker-Weidman & Hughes, 2008), and as such might be a useful prevention method for reducing the likelihood of subsequent homelessness (Willoughby, 2010).

Beyond individualised therapies, the development of 'psychologically informed environments' (PIEs), may also be helpful within the homeless community. The PIE approach is one in which organisations consider the 'psychological make-up', i.e. the thinking, emotions, past experience and personalities, of their service users in the way that they operate (Keats et al., 2012). More specifically, PIEs draw on a psychological framework, e.g. CBT, DBT, psychodynamic, in order to help staff 1) understand and reflect on the function and development of their client's behaviours, 2) consider redeveloping/designing the physical environment and social spaces to suit their client's emotional and psychological needs, and 3) increase skills in working with challenging behaviour and managing relationships with their clients (Keats, Maguire, Johnson, & Cockersall, 2012; Breedvelt, 2016).

Consequently, whilst this wouldn't necessary remove the need for specialist services, in line with this research hostels may be adapted to meet the needs of an individual's attachment system and/or provide space to develop self-regulatory strategies (Keats et al., 2012).

Finally, whilst the present research focuses on individual level factors implicated in the development of homelessness, clinical psychologists may also be

well placed to contribute to and help address macro level factors (e.g. housing and employment issues). More specifically, clinical psychologists can draw on their core research and clinical skills to guide and support policy-level interventions likely to effect the homeless population, including researching and reviewing housing/employment initiatives and ensuring policies address the multiple needs of people experiencing homelessness and poverty (Browne, 2016).

### 2.4.3 Limitations

Despite the contributions of the present study, there are limitations that future research may want to address. Firstly, as with all correlational and cross sectional research, it is impossible to draw causal links between variables from these results alone (Field, 2013). Consequently, whilst theoretically childhood adversity is thought to increase the likelihood of developing an insecure attachment this temporal sequence cannot be assumed. Future studies adopting a longitudinal approach would allow more robust conclusions around causality to be established.

The study also relied heavily on self-report measures and respective reporting, which are both vulnerable to social desirability and demand characteristics. Consequently, whilst participants were asked to be as honest as possible when answering the questionnaires, it is not possible to verify the accuracy of their responses (Erozkan, 2016). As previously discussed, the type of attachment style may have also effected responding, with individuals considered avoidant tending to minimise or deny historical experiences. Furthermore, research has found that child abuse reports are often unstable over time and as such may have been reported inaccurately as an adult (Williams, 1994).

In light of this, the study may have benefitted from using more objective measures for the factors explored (e.g. the 'GoStop' impulsivity paradigm, a behavioural measure of impulsivity; Dougherty et al., 2005). In terms of attachment styles, The Adult Attachment Interview (AAI; Main et al., 1985) which is understood to measure unconscious attachment processes may have been useful. However, this measure relates to parent-child attachment relationship rather than the adult dimensions explored in this study. Furthermore, the AAI has been criticised for being time consuming and expensive to administer (Cassidy & Shaver, 2002).

Unless the participants explicitly asked, all questionnaires were completed independently. However, given that high rates of cognitive impairment and literacy difficulties are present in the homeless population (Oakes & Davis, 2008), it is likely that a proportion of the participants would have had difficulty completing the measures, especially when double negative items were used. Participant's ability to complete questionnaires may also have been further compromised by factors associated with chronic drug and alcohol use (e.g., memory loss; Bornovalova et al., 2005) in some of the homeless individuals. Furthermore, whilst participants were excluded if they presented as under the influence of alcohol and/or drugs to an extent that would impair their ability to participate, the level of intoxication in the remaining participants was not measured and may be an important consideration in the future.

The generalisability of the findings may also be limited due to sampling bias. The study adopted an opportunistic sampling strategy which may have only captured certain types of individuals. For example, those considered to be more insecure-

avoidant or highly impulsive may not be fairly represented in the study, potentially due to characteristics of these traits.

In addition, hostel staff were involved in advertising the study, however it is unclear how and who they approached and whether they only encouraged certain types of people, e.g., services users they thought to be 'more willing'. Furthermore, whilst offering money in clinical research is a fairly common practice (Grady, 2005), given the financially disadvantaged nature of the present population, the sample may be overly represented by those especially in need of money.

Nearly all participants were living in homeless hostels (91.6%) and identified as White British (84.3%) which prevents comparisons with other homeless populations being made. Furthermore, other than one hostel in London, all recruitment took place in two cities on the south coast of the UK. Therefore it is difficult to know whether the findings can be generalised to other countries in world or even other parts of the UK.

In addition, whilst statistically significant results were found within the present study, effects sizes were generally in the small to medium range. Consequently, whilst childhood adversity and insecure attachment (where applicable) are clearly present they are by no means the exclusive factors involved in the observed associations. Therefore the other factors involved in these associations may need to be considered in future empirical studies.

For example, whilst high rates of mental health problems are found within the homeless population (Power et al., 2016) and consistently linked to the specific factors explored in the study (e.g. insecure attachment; Cantazaro & Wei, 2010), these were not investigated. Whilst it was felt this was beyond the focus of the

present research and would create additional participant burden, it would be helpful for this to be considered in future studies. Furthermore, given the high rates of conduct disorder (Whitbeck, Johnson, Hoyt & Cauce, 2003) and ADHD (Murillo et al., 2016) within the homeless population and their strong association with impulsivity difficulties, future research considering these disorders in the context of the present study is vitally important.

### 2.4.4 Recommendations for Future Research

As one of the first studies to consider the role of childhood adversity, insecure attachment and impulsivity in the homeless population, it is vital that this study is replicated before any firm conclusions can be drawn. Furthermore, future studies may want to consider using a larger and more representative sample in order to enhance the generalisability of these findings. This may include gathering information from a wider variety of ethnic groups, regions of the UK and age ranges.

Studies considering different accommodation statuses within the homeless population may also be important. For example, research has shown that individuals living on the streets demonstrate traits associated with over control (Munawar, 2009) whereas this study identified high rates of impulsiveness (i.e. under-control). Furthermore, given the link between insecure-avoidant attachment and lower levels of impulsivity in the present study, it will be interesting to explore the attachment styles of these sub-populations further.

Potentially due to time and cost saving factors, the current evidence base is inundated with cross sectional studies. However, longitudinal research is needed to establish more robust conclusions around causality. Furthermore, future studies that incorporate archival records of childhood adversity would help verify participant's

personal accounts of such experiences, especially as these are known to vary over time (Williams, 1994)

In light of the unexpected findings in this study, an alternative measure of impulsivity may be warranted in future research. As previously discussed, a measure which considers the role of affect on impulsivity may be particularly suitable, given its theoretical links to attachment styles and maladaptive behaviours (Selby, Anestis, & Joiner, 2008). For example, The Urgency, Premeditation, Perseverance, and Sensation Seeking Impulsive Behaviour Scale (UPPS; Whiteside & Lynam, 2003), which contains the subscale 'urgency' aimed at assessing the degree to which an individual acts impulsivity in the face of negative affect, may be more appropriate. However, the utility of such a measure within the homeless population is yet to be determined.

In addition, despite being a well-established measure of childhood adversity in clinical and non-clinical populations, the ACE fails to consider the duration, frequency or severity of childhood maltreatment, getting participants to purely rate 'yes' or 'no' to the occurrence of each type. However, given the evidence linking these specific factors to the severity of future drug use and mental health issues (Banyard, Williams, & Siegel, 2004) future research may want to consider a measure that includes this, e.g. The Child Abuse and Trauma Scale (CATS; Sanders & Becker-Lausen, 1995). Other forms of adverse experiences in childhood, including death of a parent, foster care/adoption, are also absent and may want to be looked at in subsequent studies.

### 2.4.5 Conclusion

Despite the limitations noted, the present study has made important contributions to a largely neglected field of research. In line with previous studies, this paper revealed increased levels of childhood adversity, insecure attachment and impulsivity within the homeless, compared to the general population. As expected, evidence of predicted associations were also found between childhood adversity, i.e. total and certain individual types, and insecure attachment, namely anxious and disorganised. However, such associations were not found for avoidant attachment. Furthermore, whilst associations were found between insecure-avoidant attachment and impulsivity, no significant associations were found between impulsivity and the other insecure attachment styles nor childhood adversity. Further research is needed to replicate and extend these findings. However, these results have given new insight into the factors implicated in the development and maintenance of homelessness. Furthermore, they have provided useful direction for the design and implementation of future psychological interventions targeted at this population.

# Appendix A Supplementary documentation for Systematic literature review.

# Appendix A1: Utilisation of attachment measures within the reviewed papers.

| Measure | Description of attachment measure | Attachment classification used | Study | Reliability within Study |
|---|---|---|---|---|
| The Inventory of Parent and Peer Attachment (IPPA; Armsden & Greenberg, 1987) | A 28-item self report measuring attachment to parent.<br><br>Scored on a 5-point Likert scale ranging from 1 = 'almost/never' to 5 = 'almost always or always'.<br><br>= Higher scores associated with more securely attached | 3 subscales measuring parental communication, trust and alienation.<br><br>Total parental attachment score obtained by summing the trust and communication subscale scores and subtracting the alienation score from the total | Benda, 2005<br><br>Benda & Belcher, 2006 | Original Manuscript – good reliability α = .72 - .92 (Armsden & Greenberg, 1987).<br><br>Reliability not reported in Benda, 2005.<br>Internal consistency α = .88 (Benda & Belcher, 2006). |
| Adult Attachment Interview (AAI; Main, Kaplan & Cassidy, 1985) | Quasi-clinical semi structured interview assessing attachment organisation based on early attachment relationships.<br><br>20 questions lastly approx. 1 hr to administer and subsequently coded using the adult attachment rating and classification (AA-RC) system (Main et al., unpublished data, 1985) | Based on the AAI-RC system, individuals classified as; Secure-Autonomous, insecure-dismissing, insecure-preoccupied or insecure-disorganised. | Taylor – Seehafer et al., 2008). | Good interrater reliability and validity within this population (Waters et al., 2000)<br><br>Reliability not reported in Taylor-Seehafer et al., 2008. |
| Attachment Styles Questionnaire (ASQ; Hazan & Shaver, 1987) | A combined single-item and rating scale measure of adult attachment.<br><br>Scored on a 7-point Likert scale for each of the four attachment styles – extent to which attachment style applies to them. | Four attachment styles are distinguished: secure, avoidant, ambivalent and disorganised. | Tavecchio et al., 1999 | Original Manuscript reliability: α = .75 for secure attachment, α =.80 for ambivalent, α =.62 for avoidant and α =.79 for disorganised. Construct validity = satisfactory. Reliability not reported in Tavecchio et al., 1999. |

| Measure | Description of attachment measure | Attachment classification used | Study | Reliability within Study |
|---|---|---|---|---|
| Relationship Questionnaire (RQ; Bartholomew & Horowitz, 1991) | Measure consisting of 4 short paragraphs describing 4 pattern of attachment.<br><br>Likeness rated using 7-point Likert scale ranging from 1 = not at all like me to 7 = very much like me. | Four attachment styles are distinguished: secure, preoccupied, dismissing and fearful. | Kidd & Shahar, 2008 | Original Manuscript reliability - α = .72 -.85.<br>Demonstrated good convergent and Discriminant validity (Bartholomew & Shaver, 1998).<br>Reliability not reported in Kidd & Shahar, 2008. |
| Parent attachment relationship<br><br>(Unvalidated, Stein et al., 2009) | 6-item self report measure. Scored on a 4-point Likert Scale, ranging from 1 = strongly agree to 4 = strong disagree.<br>Items developed by an expert panel on attachment and homeless adolescents.<br>Items used in previous publications (e.g. Milburn et al., 2005) | Two latent variables – one representing attachment to mother, one representing attachment to father.<br>Higher scores suggestive of more securely attached. | Stein et al., 2009 | Internal consistency – α = .85 for attachment to mother, α = .90 for attachment to father. |
| Adult Attachment Scale – Revised (Revised AAS; Collins & Read, 1990) | 18-item self report questionnaire. Scored on a 5-point Likert scale, ranging from 1 = not at all characteristic of me, to 5 = very characteristic of me. | 3 subscales measuring dimensions of closeness, dependency and anxiety in romantic relationships.<br>Closeness and dependency subscales are combined to obtain an overall avoidance dimension, whilst the anxiety subscale makes up an anxiety dimension. | Letcher & Slesnick, 2013. | Original Manuscript - Moderate to high reliability.<br><br>Internal consistency – α =.73 for the avoidance dimension and α =.44 for the anxiety dimension. |

| Measure | Description of attachment measure | Attachment classification used | Study | Reliability within Study |
|---|---|---|---|---|
| Family Relationship problems subscale from the Multi Problem Screening Inventory (FRP-MPSI; Hudson, 1990) | Items scored on a 7-point Likert scale ranging from none of the time to all of the time.<br><br>Reported to be used frequently to measure attachment to care-givers (Hudson, 1999). | Higher scores indicative of more securely attached. | Benda, 2003a<br><br>Benda, 2003b<br><br>Rodell, Benda & Rodell, 2003. | Internal consistency reported as – α =.80 or higher in all studies. |

# Appendix A2: Utilisation of maladaptive behaviour measures within the reviewed papers.

| Measure | Description of measure | Study | Clinical cut off used | Reliability |
|---|---|---|---|---|
| Simple Screening Instrument for Alcohol or other Drug Abuse (US Department of Health and Human Services, 1995) | 16-item self report measures assessing alcohol and drug use during the past 6 months.<br><br>Scored using 'yes' or 'no' response options.<br><br>The score range is 0-14 | Taylor-Seehafer et al., 2008. | Problematic drug/alcohol use = ≥ 4 | Reliability not reported in Taylor-Seehafer et al., 2008. |
| Form 90-D drug interview (Miller, 1996) | Structured interview assessing use and frequency of alcohol and drug use over past 90 days. | Letcher & Slesnick, 2013. | No reported | No reported in Letcher & Slesnick (2013).<br><br>Acceptable test-retest reliability with correlation coefficients ranging from *r* =.76 to .99 (Scheurich et al., 2005) |
| Addiction Severity Index (ASI; McLellan et al., 1992). | A semi-structured interview focused on 7 functional areas known to be widely affected by substance abuse.<br><br>Provides a 10-point severity rating for each area leading to a total composite score.<br>Higher scores indicate higher severity. | Rodell, Benda & Rodell, 2003. | Not reported. | Reported to have good reliability and validity for veteran who have abused substances (Rosen et al., 2000) |

| Measure | Description of measure | Study | Clinical cut off used | Reliability |
|---|---|---|---|---|
| Substance Use Measure (Unvalidated, Stein et al., 2009) | 5-item self report scale measuring frequency and type of drug use.<br><br>Weekly use for drugs measured on a 6-point Likert scale.<br><br>Daily use for alcohol measured by number per day (0-16 drinks).<br><br>Generated for this study. | Stein et al., 2009 | Not used | Internal consistency within study – $\alpha$ =.68 |
| Drug Abuse subscale from the Multi Problem Screening Inventory (DA-MPSI; Hudson, 1990) | 10-item self report measure scored on a 7-point Likert scale ranging from 'none of the time' to 'all of the time'. | Benda & Belcher (2006) Benda (2003b) | Not reported although higher scores indicate increased severity of problem. | Internal consistency reported as – $\alpha$ =.80 or higher in Benda & Belcher (2006) and Benda (2003b). |
| Drug Use Measure (Unvalidated, derived from Baron, 1999) | Frequency of drug use (i.e. Marijuana, cocaine, tranquilizers, psychedelics, ecstasy, amphetamines, heroin and narcotics) assessed using 5-point Likert scale ranging from 1 = never to 5 = every day. | Kidd & Shahar, 2008 | Not reported | Internal consistency reported in study as – $\alpha$ =.69 |

| Measure | Description of measure | Study | Clinical cut off used | Reliability |
|---|---|---|---|---|
| Alcohol Abuse subscale from the Multi Problem Screening Inventory (AA-MPSI; Hudson, 1990) | 15-item self report measure scored on a 7-point Likert scale ranging from 'none of the time' to 'all of the time'. | Benda & Belcher (2006)<br><br>Benda (2003b) | Not reported although higher scores indicate increased severity of problem | Internal consistency reported as – α =.80 or higher in in Benda & Belcher (2006) and Benda (2003b) |
| Survival Sex Measure (Unvalidated, Stein et al., 2009) | 3-items concerning sexual behaviour for money or other rewards with 'yes' or 'no' response option. Generated for this study. | Stein et al., 2009 | Not used | Internal consistency within study – α =.73 |
| Sex Trade Involvement Measure (Unvalidated; Greene, et al., 1999) | A 1-item question, i.e. 'have you had sex or done sexual acts with someone to get drugs etc.?' Scored on a 4-point Likert scale ranging from 1 = never to 4 = 11 or more times. | Kidd & Shahar (2008) | Not reported. | Not reported. |
| Health Risk Questionnaire (Unvalidated, Letcher & Slesnick, 2013 | Self report questionnaire to assess 'risky' sexual activity generated for this study. Questions taken and from the Health Risk Survey (Kann et al., 1989) and the Homeless Youth Questionnaire (Johnson et al., 1996) | Letcher & Slesnick, 2013 | No reported | Not reported in Letcher & Slesnick, 2013. |

No other information provided.

| Measure | Description of measure | Study | Clinical cut off used | Reliability |
|---|---|---|---|---|
| Suicidal Ideation Measure (Unvalidated, derived from Lewinsohn, Rohde, & Seeley, 1996). | 4-item self report scale. Scored using a four-point Likert scale ranging from 1 = never to 4 = all the time. | Kidd & Shahar (2008) | Not reported | Internal consistency reported in study as – α =.87<br><br>Shown good reliability in previous studies within this population (e.g. α = .80 - .89; Yoder et al., 1998) |
| Suicidal thoughts subscale from the Multi Problem Screening Inventory (ST-MPSI; Hudson, 1990) | 11-item self report measure scored on a 7-point Likert scale ranging from 'none of the time' to 'all of the time'. | Benda, 2003a<br><br>Benda, 2005<br><br>Rodell, Benda & Rodell, 2003 | 'Problem with suicidal thoughts' = score ≥ 15. | Reported to have 'solid validity' (Hudson & McMurtry, 1997)<br><br>Internal consistency reported as – α =.80 or higher in Benda (2003a), Benda (2005) and Rodell et al (2003). |
| Delinquent behaviour measure (Unvalidated, Stein et al., 2009) | 3-items self-report measure concerning delinquent behaviour (e.g. aggression, violence) with 'yes' or 'no' response option. Generated for this study. | Stein et al., 2009 | Not used | Internal consistency within study – α =.65 |

| Measure | Description of measure | Study | Clinical cut off used | Reliability |
|---|---|---|---|---|
| Anti-Social Behaviour Inventory (ASBI; Wouters & Spiering, 1990). | 54-item self report measure assessing delinquent behaviour, e.g. threatening or using physical violence. Scored on a 4-point Likert scale ranging from 0 = never to 3 = often. | Tavecchio et al., 1999. | Not used. | Internal consistency within study – $\alpha = .96$ |

# Appendix A3: NHLBI Quality Assessment Tool for Case Control Studies.

| Criteria | Yes | No | Other (CD, NR, NA)* |
|---|---|---|---|
| 1. Was the research question or objective in this paper clearly stated and appropriate? | | | |
| 2. Was the study population clearly specified and defined? | | | |
| 3. Did the authors include a sample size justification? | | | |
| 4. Were controls selected or recruited from the same or similar population that gave rise to the cases (including the same timeframe)? | | | |
| 5. Were the definitions, inclusion and exclusion criteria, algorithms or processes used to identify or select cases and controls valid, reliable, and implemented consistently across all study participants? | | | |
| 6. Were the cases clearly defined and differentiated from controls? | | | |
| 7. If less than 100 percent of eligible cases and/or controls were selected for the study, were the cases and/or controls randomly selected from those eligible? | | | |
| 8. Was there use of concurrent controls? | | | |
| 9. Were the investigators able to confirm that the exposure/risk occurred prior to the development of the condition or event that defined a participant as a case? | | | |
| 10. Were the measures of exposure/risk clearly defined, valid, reliable, and implemented consistently (including the same time period) across all study participants? | | | |
| 11. Were the assessors of exposure/risk blinded to the case or control status of participants? | | | |
| 12. Were key potential confounding variables measured and adjusted statistically in the analyses? If matching was used, did the investigators account for matching during study analysis? | | | |

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

## Guidance for Assessing the Quality of Case-Control Studies

The guidance document below is organized by question number from the tool for quality assessment of case-control studies.

### Question 1. Research question

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

### Question 2. Study population

Did the authors describe the group of individuals from which the cases and controls were selected or recruited, while using demographics, location, and time period? If the investigators conducted this study again, would they know exactly who to recruit, from where, and from what time period?

Investigators identify case-control study populations by location, time period, and inclusion criteria for cases (individuals with the disease, condition, or problem) and controls (individuals without the disease, condition, or problem). For example, the population for a study of lung cancer and chemical exposure would be all incident cases of lung cancer diagnosed in patients ages 35 to 79, from January 1, 2003 to December 31, 2008, living in Texas during that entire time period, as well as controls without lung cancer recruited from the same population during the same time period. The population is clearly described as: (1) who (men and women ages 35 to 79 with (cases) and without (controls) incident lung cancer); (2) where (living in Texas); and (3) when (between January 1, 2003 and December 31, 2008).

Other studies may use disease registries or data from cohort studies to identify cases. In these cases, the populations are individuals who live in the area covered by the disease registry or included in a cohort study (i.e. nested case-control or case-cohort). For example, a study of the relationship between vitamin D intake and myocardial infarction might use patients identified via the GRACE registry, a database of heart attack patients.

NHLBI staff encouraged reviewers to examine prior papers on methods (listed in the reference list) to make this assessment, if necessary.

### Question 3. Target population and case representation

In order for a study to truly address the research question, the target population–the population from which the study population is drawn and to which study results are

believed to apply–should be carefully defined. Some authors may compare characteristics of the study cases to characteristics of cases in the target population, either in text or in a table. When study cases are shown to be representative of cases in the appropriate target population, it increases the likelihood that the study was well-designed per the research question.

However, because these statistics are frequently difficult or impossible to measure, publications should not be penalized if case representation is not shown. For most papers, the response to question 3 will be "NR." Those subquestions are combined because the answer to the second subquestion–case representation–determines the response to this item. However, it cannot be determined without considering the response to the first subquestion. For example, if the answer to the first subquestion is "yes," and the second, "CD," then the response for item 3 is "CD."

**Question 4. Sample size justification**

Did the authors discuss their reasons for selecting or recruiting the number of individuals included? Did they discuss the statistical power of the study and provide a sample size calculation to ensure that the study is adequately powered to detect an association (if one exists)? This question does not refer to a description of the manner in which different groups were included or excluded using the inclusion/exclusion criteria (e.g. "Final study size was 1,378 participants after exclusion of 461 patients with missing data" is not considered a sample size justification for the purposes of this question).

An article's methods section usually contains information on sample size and the size needed to detect differences in exposures and on statistical power.

**Question 5. Groups recruited from the same population**

To determine whether cases and controls were recruited from the same population, one can ask hypothetically, "If a control was to develop the outcome of interest (the condition that was used to select cases), would that person have been eligible to become a case?" Case-control studies begin with the selection of the cases (those with the outcome of interest, e.g. lung cancer) and controls (those in whom the outcome is absent). Cases and controls are then evaluated and categorized by their exposure status. For the lung cancer example, cases and controls were recruited from hospitals in a given region. One may reasonably assume that controls in the catchment area for the hospitals, or those already in the hospitals for a different reason, would attend those hospitals if they became a case; therefore, the controls are drawn from the same population as the cases. If the controls were recruited or selected from a different region (e.g. a State other than Texas) or time period (e.g. 1991-2000), then the cases and controls were recruited from different populations, and the answer to this question would be "no."

The following example further explores selection of controls. In a study, eligible cases were men and women, ages 18 to 39, who were diagnosed with atherosclerosis at hospitals in Perth, Australia, between July 1, 2000 and December 31, 2007. Appropriate controls for these cases might be sampled using voter registration information for men and women ages 18 to 39, living in Perth (population-based controls); they also could be sampled from patients without atherosclerosis at the same hospitals (hospital-based controls). As long as the controls are individuals who would have been eligible to be included in the study as cases (if they had been diagnosed with atherosclerosis), then the controls were selected appropriately from the same source population as cases.

In a prospective case-control study, investigators may enrol individuals as cases at the time they are found to have the outcome of interest; the number of cases usually increases as time progresses. At this same time, they may recruit or select controls from the population without the outcome of interest. One way to identify or recruit cases is through a surveillance system. In turn, investigators can select controls from the population covered by that system. This is an example of population-based controls. Investigators also may identify and select cases from a cohort study population and identify controls from outcome-free individuals in the same cohort study. This is known as a nested case-control study.

**Question 6. Inclusion and exclusion criteria prespecified and applied uniformly**

Were the inclusion and exclusion criteria developed prior to recruitment or selection of the study population? Were the same underlying criteria used for all of the groups involved? To answer this question, reviewers determined if the investigators developed I/E criteria prior to recruitment or selection of the study population and if they used the same underlying criteria for all groups. The investigators should have used the same selection criteria, except for study participants who had the disease or condition, which would be different for cases and controls by definition. Therefore, the investigators use the same age (or age range), gender, race, and other characteristics to select cases and controls. Information on this topic is usually found in a paper's section on the description of the study population.

**Question 7. Case and control definitions**

For this question, reviewers looked for descriptions of the validity of case and control definitions and processes or tools used to identify study participants as such. Was a specific description of "case" and "control" provided? Is there a discussion of the validity of the case and control definitions and the processes or tools used to identify study participants as such? They determined if the tools or methods were accurate, reliable, and objective. For example, cases might be identified as "adult patients admitted to a VA hospital from January 1, 2000 to December 31, 2009, with an ICD-9 discharge diagnosis code of acute myocardial infarction and at least one of the two confirmatory findings in their medical records: at least 2mm of ST elevation changes in two or more ECG leads and an elevated troponin level. Investigators

might also use ICD-9 or CPT codes to identify patients. All cases should be identified using the same methods. Unless the distinction between cases and controls is accurate and reliable, investigators cannot use study results to draw valid conclusions.

**Question 8. Random selection of study participants**

If a case-control study did not use 100 percent of eligible cases and/or controls (e.g. not all disease-free participants were included as controls), did the authors indicate that random sampling was used to select controls? When it is possible to identify the source population fairly explicitly (e.g. in a nested case-control study, or in a registry-based study), then random sampling of controls is preferred. When investigators used consecutive sampling, which is frequently done for cases in prospective studies, then study participants are not considered randomly selected. In this case, the reviewers would answer "no" to Question 8. However, this would not be considered a fatal flaw.

If investigators included all eligible cases and controls as study participants, then reviewers marked "NA" in the tool. If 100 percent of cases were included (e.g. NA for cases) but only 50 percent of eligible controls, then the response would be "yes" if the controls were randomly selected, and "no" if they were not. If this cannot be determined, the appropriate response is "CD."

**Question 9. Concurrent controls**

A concurrent control is a control selected at the time another person became a case, usually on the same day. This means that one or more controls are recruited or selected from the population without the outcome of interest at the time a case is diagnosed. Investigators can use this method in both prospective case-control studies and retrospective case-control studies. For example, in a retrospective study of adenocarcinoma of the colon using data from hospital records, if hospital records indicate that Person A was diagnosed with adenocarcinoma of the colon on June 22, 2002, then investigators would select one or more controls from the population of patients without adenocarcinoma of the colon on that same day. This assumes they conducted the study retrospectively, using data from hospital records. The investigators could have also conducted this study using patient records from a cohort study, in which case it would be a nested case-control study.

Investigators can use concurrent controls in the presence or absence of matching and vice versa. A study that uses matching does not necessarily mean that concurrent controls were used.

**Question 10. Exposure assessed prior to outcome measurement**

Investigators first determine case or control status (based on presence or absence of outcome of interest), and then assess exposure history of the case or control; therefore, reviewers ascertained that the exposure preceded the outcome. For example, if the investigators used tissue samples to determine exposure, did they collect them from patients prior to their diagnosis? If hospital records were used, did investigators verify that the date a patient was exposed (e.g. received medication for atherosclerosis) occurred prior to the date they became a case (e.g. was diagnosed with type 2 diabetes)? For an association between an exposure and an outcome to be considered causal, the exposure must have occurred prior to the outcome.

**Question 11. Exposure measures and assessment**

Were the exposure measures defined in detail? Were the tools or methods used to measure exposure accurate and reliable–for example, have they been validated or are they objective? This is important, as it influences confidence in the reported exposures. Equally important is whether the exposures were assessed in the same manner within groups and between groups. This question pertains to bias resulting from exposure misclassification (i.e. exposure ascertainment).

For example, a retrospective self-report of dietary salt intake is not as valid and reliable as prospectively using a standardized dietary log plus testing participants' urine for sodium content because participants' retrospective recall of dietary salt intake may be inaccurate and result in misclassification of exposure status. Similarly, BP results from practices that use an established protocol for measuring BP would be considered more valid and reliable than results from practices that did not use standard protocols. A protocol may include using trained BP assessors, standardized equipment (e.g. the same BP device which has been tested and calibrated), and a standardized procedure (e.g. patient is seated for 5 minutes with feet flat on the floor, BP is taken twice in each arm, and all four measurements are averaged).

**Question 12. Blinding of exposure assessors**

Blinding or masking means that outcome assessors did not know whether participants were exposed or unexposed. To answer this question, reviewers examined articles for evidence that the outcome assessor(s) was masked to the exposure status of the research participants. An outcome assessor, for example, may examine medical records to determine the outcomes that occurred in the exposed and comparison groups. Sometimes the person measuring the exposure is the same person conducting the outcome assessment. In this case, the outcome assessor would most likely not be blinded to exposure status. A reviewer would note such a finding in the comments section of the assessment tool.

One way to ensure good blinding of exposure assessment is to have a separate committee, whose members have no information about the study participants' status

as cases or controls, review research participants' records. To help answer the question above, reviewers determined if it was likely that the outcome assessor knew whether the study participant was a case or control. If it was unlikely, then the reviewers marked "no" to Question 12. Outcome assessors who used medical records to assess exposure should not have been directly involved in the study participants' care, since they probably would have known about their patients' conditions. If the medical records contained information on the patient's condition that identified him/her as a case (which is likely), that information would have had to be removed before the exposure assessors reviewed the records.

If blinding was not possible, which sometimes happens, the reviewers marked "NA" in the assessment tool and explained the potential for bias.

**Question 13. Statistical analysis**

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

This is a key issue in case-controlled studies; statistical analyses need to control for potential confounders, in contrast to RCTs in which the randomization process controls for potential confounders. In the analysis, investigators need to control for all key factors that may be associated with both the exposure of interest and the outcome and are not of interest to the research question.

A study of the relationship between smoking and CVD events illustrates this point. Such a study needs to control for age, gender, and body weight; all are associated with smoking and CVD events. Well-done case-control studies control for multiple potential confounders.

Matching is a technique used to improve study efficiency and control for known confounders. For example, in the study of smoking and CVD events, an investigator might identify cases that have had a heart attack or stroke and then select controls of similar age, gender, and body weight to the cases. For case-control studies, it is important that if matching was performed during the selection or recruitment process, the variables used as matching criteria (e.g. age, gender, race) should be controlled for in the analysis.

## A4. The NHLBI Quality Assessment Tool for Observational Cohort and Cross-Sectional Studies.


### Quality Assessment Tool for Observational Cohort and Cross-Sectional Studies

| Criteria | Yes | No | Other (CD, NR, NA)* |
|---|---|---|---|
| 1. Was the research question or objective in this paper clearly stated? | | | |
| 2. Was the study population clearly specified and defined? | | | |
| 3. Was the participation rate of eligible persons at least 50%? | | | |
| 4. Were all the subjects selected or recruited from the same or similar populations (including the same time period)? Were inclusion and exclusion criteria for being in the study prespecified and applied uniformly to all participants? | | | |
| 5. Was a sample size justification, power description, or variance and effect estimates provided? | | | |
| 6. For the analyses in this paper, were the exposure(s) of interest measured prior to the outcome(s) being measured? | | | |
| 7. Was the timeframe sufficient so that one could reasonably expect to see an association between exposure and outcome if it existed? | | | |
| 8. For exposures that can vary in amount or level, did the study examine different levels of the exposure as related to the outcome (e.g., categories of exposure, or exposure measured as continuous variable)? | | | |
| 9. Were the exposure measures (independent variables) clearly defined, valid, reliable, and implemented consistently across all study participants? | | | |
| 10. Was the exposure(s) assessed more than once over time? | | | |
| 11. Were the outcome measures (dependent variables) clearly defined, valid, reliable, and implemented consistently across all study participants? | | | |
| 12. Were the outcome assessors blinded to the exposure status of participants? | | | |
| 13. Was loss to follow-up after baseline 20% or less? | | | |
| 14. Were key potential confounding variables measured and adjusted statistically for their impact on the relationship between exposure(s) and outcome(s)? | | | |

| Quality Rating (Good, Fair, or Poor) (see guidance) |
|---|
| Rater #1 initials: |
| Rater #2 initials: |
| Additional Comments (If POOR, please state why): |

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

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

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

***Question 1. Research question***

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

***Questions 2 and 3. Study population***

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

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

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

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

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

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

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

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

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

### *Question 5. Sample size justification*

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

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

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

### *Question 6. Exposure assessed prior to outcome measurement*

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

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

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

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

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

### *Question 7. Sufficient timeframe to see an effect*

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

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

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

### *Question 8. Different levels of the exposure of interest*

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

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

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

### *Question 9. Exposure measures and assessment*

Were the exposure measures defined in detail? Were the tools or methods used to measure exposure accurate and reliable–for example, have they been validated or are they objective? This issue is important as it influences confidence in the reported exposures. When exposures are measured with less accuracy or validity, it is

harder to see an association between exposure and outcome even if one exists. Also as important is whether the exposures were assessed in the same manner within groups and between groups; if not, bias may result.

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

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

### *Question 10. Repeated exposure assessment*

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

### *Question 11. Outcome measures*

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

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

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

### *Question 12. Blinding of outcome assessors*

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

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

### *Question 13. Followup rate*

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

### *Question 14. Statistical analyses*

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

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

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

# Appendix A5. The NHLBI ratings for articles (Observational Cohort and Cross-Sectional Studies)

| Article | 1. Was the research question/objective clearly stated? | 2. Was the study population clearly specified and defined? | 3. Was the participation rate of eligible persons at least 50%? | 4. Were all subjects selected from same/similar populations AND were inclusion/exclusion criteria pre-specified and applied uniformly? | 5. Was the sample size justification, power description provided? | 6. Was the exposure of interest prior to outcome being measured? | 7. Was the timeframe sufficient to be able to see an association between exposure and outcome if it existed? | 8. Did the study examine different levels of the exposure of interest as related to the outcome? | 9. Were the exposure measures clearly defined, valid, reliable and implemented consistently? | 10. Were the exposure(s) assessed more than once over time? | 11. Were the outcome measures clearly defined, valid, reliable and implemented consistently? | 12. Were the outcome assessors blinded to the exposure status of participants? | 13. Was loss to follow-up after baseline 20% or less? | 14. Were key confounding variables measured/adjusted statistically for their impact on the relationship between exposure and outcome? | Overall quality score and rating |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Benda, 2003a | √ | √ | √ | √ | X | X | X | √ | √ | n/a | √ | X | n/a | √ | 66.6% Fair |
| Benda, 2005 | √ | √ | √ | √ | X | X | X | √ | √ | n/a | √ | X | n/a | √ | 66.6% Fair |
| Benda & Belcher, 2006 | √ | √ | √ | √ | X | X | X | √ | √ | n/a | √ | n/a | n/a | √ | 72.7% Good |
| Kidd & Shahar, 2008 | √ | √ | √ | X | X | X | X | √ | √ | n/a | √ | n/a | n/a | √ | 63.6% Fair |
| Letcher & Slesnick, 2013 | √ | √ | √ | √ | X | X | X | √ | √ | n/a | √ | n/a | n/a | √ | 72.7% Good |
| Rodell et al., 2003 | √ | √ | √ | X | X | X | X | √ | √ | n/a | √ | n/a | n/a | √ | 63.6% Fair |
| Stein et al., 2009 | √ | √ | √ | √ | X | X | X | √ | X | n/a | X | X | n/a | √ | 50% Fair |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Taylor-Seehafer et al., 2008 | √ | √ | X | X | X | √ | X | √ | √ | n/a | X | √ | n/a | X | 50% Fair |

# Appendix A6. The NHLBI ratings for articles (Case Control Studies)

| Article | 1. Was the research question/objective clearly stated? | 2. Was the study population clearly specified and defined? | 3. Was a sample size justification included? | 4. Were controls selected from the same/similar population as cases? | 5. Were the definitions, inclusion/exclusion criteria and processes used to identify cases/controls pre-specified and uniform? | 6. Were the cases clearly defined and differentiated from the controls? | 7. Were cases and/or controls randomly selected from those eligible? | 8. Were there used of concurrent controls? | 9. Were investigators able to confirm exposure occurred prior to outcome? | 10. Were the exposure measures clearly defined, valid, reliable and implemented consistently? | 11. Were the assessors blinded to the case or control status of participants? | 12. Were key confounding variables measured/adjusted statistically in analysis? | Overall quality score and rating |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Benda, 2003b | √ | √ | X | √ | √ | √ | √ | √ | √ | √ | X | √ | 83.3% Good |
| Tavecchio et al, 1999 | √ | √ | X | X | √ | √ | X | X | X | √ | X | √ | 50% Fair. |

# Appendix B Supplementary Documentation for the Empirical Paper

# Appendix B1 – Demographic Questionnaire

UNIVERSITY OF Southampton

## Demographic Data

- ☐ Male
- ☐ Female

- Age: _____

- How many years of full time education (including school, college, university) .....

- Did you ever require additional support with your learning at school? Yes/No (please delete as appropriate)

  If yes please provide details:
  .....
  .....
  .....
  .....
  .....
  .....
  .....

- What qualifications do you have? Please provide details:
  .....
  .....
  .....
  .....
  .....
  .....
  .....

- Ethnicity: (Please tick one box)

| White | Black | Asian | Mixed |
|---|---|---|---|
| ☐ **British** | ☐ African | ☐ Bangladeshi | ☐ White + Black African |
| ☐ **Irish** | ☐ **Caribbean** | ☐ **Pakistani** | ☐ **White + Black Caribbean** |
| ☐ **Other** | ☐ **Other** | ☐ **Indian** | ☐ **White + Asian** |
| | | ☐ **Chinese** | ☐ **Black + Asian** |
| | | ☐ **Other** | ☐ **Other** |

- **What is your current circumstances with regards to accommodation? (Please tick one box)**

☐ **sleeping on the streets** ☐ **staying in a squat** ☐ **staying in a shelter**

☐ **in derelict buildings** ☐ **Staying on friends sofa's** ☐ **Staying in homeless hostel** ☐ **other outdoor** ..... ☐ **Overcrowded housing** ☐ **other** .....

- **When was the first time you became homeless? Approximate date** _____

- **How old were you when you first became homeless? Approximate age** _____

- **Roughly how many different times have you been homeless? Approximately _____ times.**

- **Roughly how long have you been homeless this time? Approx. _____years _____ months.**

# Appendix B2 –Adverse Childhood Experiences Questionnaire (ACE)

| **While you were growing up, during your first 18 years of life:** | | |
|---|---|---|
| 1. Did a parent or other adult in the household **often** …<br><br>Swear at you, insult you, put you down, or humiliate you?<br>**or**<br>Act in a way that made you afraid that you might be physically hurt? | YES | NO |
| 2. Did a parent or other adult in the household **often** …<br><br>Push, grab, slap, or throw something at you?<br>**or**<br>**Ever** hit you so hard that you had marks or were injured? | YES | NO |
| 3. Did an adult or person at least 5 years older than you **ever**…<br><br>Touch or fondle you or have you touch their body in a sexual way?<br>**Or**<br>Attempt to or actually have any type of sexual intercourse with you? | YES | NO |
| 4. Did you **often** feel that …<br><br>No one in your family loved you or thought you were important or special?<br>**or**<br>Your family didn't look out for each other, feel close to each other, or support each other? | YES | NO |
| 5. Did you **often** feel that …<br><br>You didn't have enough to eat, had to wear dirty clothes, and had no one to protect you?<br>**or**<br>Your parents were too drunk or high to take care of you or take you to the doctor if you needed it? | YES | NO |
| 6. Were your parents **ever** separated or divorced? | YES | NO |
| 7. Was your mother or stepmother:<br><br>**Often** pushed, grabbed, slapped, or had something thrown at her?<br>**or**<br>**Sometimes or often** kicked, bitten, hit with a fist, or hit with something hard?<br>**or**<br>**Ever** repeatedly hit over at least a few minutes or threatened with a gun or knife? | YES | NO |
| 8. Did you live with anyone who was a problem drinker or alcoholic or who used street drugs? | YES | NO |
| 9. Was a household member depressed or mentally ill or did a household member attempt suicide? | YES | NO |
| 10. Did a household member go to prison? | YES | NO |

# Appendix B3 - The Experiences in Close Relationships – Revised (ECR-R)

## Please read the following information carefully:

The statements below concern how you feel in emotionally intimate relationships. You can think about how you tend to feel in close relationship generally or focus on a particular relationship or type of relationship. Typical examples include you relationship with your current romantic partner, romantic partners in general, your mother, your father, your best friend, or friends in general.

Using the 1 to 7 scale, after each statement write a number than indicates how much you agree or disagree with each statement.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| *strongly disagree* | | | | | | *strongly agree* |

| | | |
|---|---|---|
| *1.* | I'm afraid that I will lose this person's/others' love | |
| *2.* | I prefer not to show this person/others how I feel deep down | |
| *3.* | I often worry that this person/others will not want to stay with me | |
| *4.* | I feel comfortable sharing my private thoughts and feelings with this person/others | |
| *5.* | I often worry that this person/others don't really love me | |
| *6.* | I find it difficult to allow myself to depend on this person/others | |
| *7.* | I worry that this person/others won't care about me as much as I care about them | |

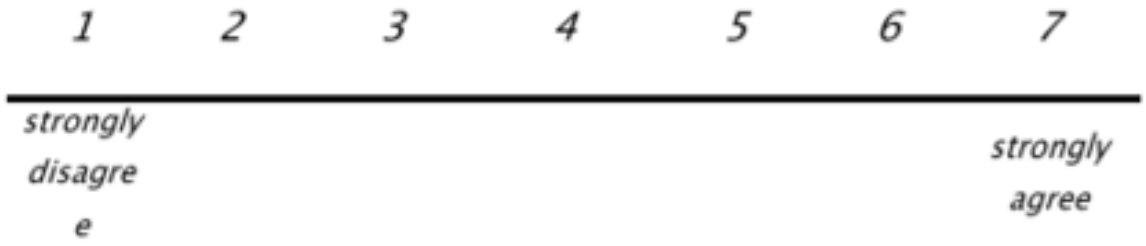
| | | |
|---|---|---|
| *8.* | I am very comfortable being close to this person/others | |
| *9.* | I often wish that this person's/others' feelings for me were as strong as my feelings for them | |
| *10.* | I don't feel comfortable opening up to this person/others | |
| *11.* | I worry a lot about my relationship(s) | |
| *12.* | I prefer not to be too close to this person/others | |
| *13.* | when this person/others are out of sight, I worry that they might become interested in someone else (and leave/exclude me) | |
| *14.* | I get uncomfortable when this person/others want to be very close | |
| *15.* | when I show my feelings for this person/others, I'm afraid they will not feel the same about me | |
| *16.* | I find it relatively easy to get close to this person/others | |
| *17.* | I rarely worry about this person/others leaving me | |
| *18.* | it's not difficult for me to get close to this person/others | |
| *19.* | this person/others make me doubt myself | |
| *20.* | I usually discuss my problems and concerns with this person/others | |
| *21.* | I do not often worry about being abandoned | |
| *22.* | it helps to turn to this person/others in times of need | |
| *23.* | I find that this person/others don't want to get as close as I would like | |
| *24.* | I tell this person/others just about everything | |
| *25.* | sometimes this person/others change their feelings about me for no apparent reason | |

| | | |
|---|---|---|
| *26.* | I talk things over with this person/others | |
| *27.* | my desire to be very close sometimes scares this person/others away | |
| *28.* | I am nervous when this person/others get too close to me | |
| *29.* | I'm afraid that once this person/others get to know me, they won't like who I really am | |
| *30.* | I feel comfortable depending on this person/others | |
| *31.* | it makes me mad that I don't get the affection and support I need from this partner/others | |
| *32.* | I find it easy to depend on this person/others | |
| *33.* | I worry that I won't measure up to other people | |
| *34.* | it's easy for me to be affectionate with this person/others | |
| *35.* | this person/others only seems to notice me when I'm angry | |
| *36.* | this person/others really understands me and my needs | |

# Appendix B4 - Adult Disorganised Attachment Scale (ADA)

## V2. Please read the following information carefully:

The statements below concern how you feel in emotionally intimate relationships. You can think about how you feel in close relationship generally or focus on a particular relationship or type of relationship. E.g. relationship with your current romantic partner, romantic partners in general, your mother, your father, your best friend, or friends in general. Using the 1 to 7 scale, after each statement write a number than indicates how much you agree or disagree with each statement.




| | |
|---|---|
| **1. Fear is a common feeling in close relationships.** | |
| **2. I believe that people I am close to often try to take advantage of each other.** | |
| **3. I never know who I am with people I am close to.** | |
| **4. I find people I am close to rather scary** | |
| **5. It is dangerous to trust people I am close to.** | |
| **6. It is normal to have traumatic experiences with the people you feel close to.** | |
| **7. Strangers are not as scary as people I am close to.** | |
| **8. I could never view people I am close to as totally trustworthy.** | |
| **9. Compared to most people, I feel generally confused about people I am close to.** | |

# Appendix B5 - The Barratt Impulsiveness Scale (BIS-11)

DIRECTIONS: people differ in the ways they act and think in different situations. This is a test to measure some of the different ways in which you act and think.

Read each statement and put a circle round the number that applies to you. Do not spend too much time on any statement. Answer quickly and honestly.

1 = Rarely/Never 2 = Occasionally 3 = Often 4 = Almost always/Always

| | | | | |
|---|---|---|---|---|
| 1. I plan tasks carefully. | 1 | 2 | 3 | 4 |
| 2. I do things without thinking. | 1 | 2 | 3 | 4 |
| 3. I make-up my mind quickly. | 1 | 2 | 3 | 4 |
| 4. I am happy-go-lucky. | 1 | 2 | 3 | 4 |
| 5. I don't "pay attention". | 1 | 2 | 3 | 4 |
| 6. I have racing thoughts. | 1 | 2 | 3 | 4 |
| 7. I plan trips well ahead of time. | 1 | 2 | 3 | 4 |
| 8. I am self-controlled. | 1 | 2 | 3 | 4 |
| 9. I concentrate easily. | 1 | 2 | 3 | 4 |
| 10. I save regularly. | 1 | 2 | 3 | 4 |
| 11. I find it hard to sit still for long periods of time. | 1 | 2 | 3 | 4 |
| 12. I am a careful thinker. | 1 | 2 | 3 | 4 |
| 13. I plan for job security. | 1 | 2 | 3 | 4 |
| 14. I say things without thinking. | 1 | 2 | 3 | 4 |
| 15. I like to think about complex things. | 1 | 2 | 3 | 4 |
| 16. I change jobs. | 1 | 2 | 3 | 4 |
| 17. I act 'on impulse'. | 1 | 2 | 3 | 4 |
| 18. I get easily bored when solving thought problems. | 1 | 2 | 3 | 4 |

| | | | | |
|---|---|---|---|---|
| 19. I act on the spur of the moment. | 1 | 2 | 3 | 4 |
| 20. I am a steady thinker. | 1 | 2 | 3 | 4 |
| 21. I change where I live. | 1 | 2 | 3 | 4 |
| 22. I buy things on impulse. | 1 | 2 | 3 | 4 |
| 23. I can only think about one thing at a time. | 1 | 2 | 3 | 4 |
| 24. I change hobbies. | 1 | 2 | 3 | 4 |
| 25. I spend more than I earn. | 1 | 2 | 3 | 4 |
| 26. I often irrelevant thoughts when thinking. | 1 | 2 | 3 | 4 |
| 27. I am more interested in the present than the future. | 1 | 2 | 3 | 4 |
| 28. I am restless at lectures or talks. | 1 | 2 | 3 | 4 |
| 29. I like puzzles. | 1 | 2 | 3 | 4 |
| 30. I plan for the future. | 1 | 2 | 3 | 4 |

# Appendix B6 – Recruitment Poster

# Appendix B7 – Information Sheet

## Participant Information Sheet

**Study Title**: The impact of childhood experiences on people experiencing homelessness
**ERGO number: 26424**

***You are being asked if you would agree to take part in an evaluation that is entirely separate from the support you are currently receiving. Before you decide if you wish to participate, it is important that you understand why the research is being carried out and what it will involve. Please read this information carefully before deciding to take part in this research. It is up to you to decide whether or not to take part. If you are happy to participate you will be asked to sign a consent form.***

**What is the research about?**
This research project incorporates two Doctorate in Clinical Psychology thesis projects, both of which exploring the impact of childhood experiences on the lives of people experiencing homelessness. Xxxxxx will be exploring the relationship between difficult childhood experiences, relationships with others and impulsivity, whilst xxxxx will be exploring the relationship between difficult childhood experiences, facial emotion recognition and unhelpful behaviours.
**Why have I been asked to participate?**
We are approaching you to take part in this research because you have been identified as a service user of a homeless hostel or of supported accommodation for homeless people.

**What will happen to me if I take part?**
You will be asked to complete set of questionnaires and a short computer task looking at faces. In total this should take no longer than 1 hour. The questionnaires will ask you about your childhood experiences, your relationships, impulsivity and emotional control.

The data that we collect will only be accessed by those working on the project, and will be stored securely for a period of 10 years, after which it will be securely destroyed. Your data will be stored anonymously and will be kept on a password protected computer all data use is strictly within the terms of the Data Protection Act (DPA, 1998).

**Are there any benefits in my taking part?**
You will receive a £6 voucher in return for your time if you decide to take part. By taking part in this research you will help us to better understand homelessness and the difficulties that can come with this. This information may be helpful for services and for supporting individuals experiencing homelessness in future.

**Are there any risks involved?**
It's possible that you might find completion of the questionnaires a little upsetting. The questionnaires will ask you questions about your childhood, including questions about experiences of abuse or neglect for example *'Did a parent or other adult often push, grab, slap or throw something at you?'*

Some questions will also ask you about your past/current drug/alcohol use and your past/current accommodation situation. If you do feel distressed after taking part, the researchers administering the questionnaires will provide you with a few points of contact who you can turn to for support, or to discuss your feelings in greater detail. These points of contact and support are included on the debriefing form which the researchers will give to you at the end of the questionnaires. The researchers are also able to answer any

questions you have about the research or you can contact Nick Maguire at the University of Southampton, for more detail, by telephone: 02380597760, or email: nick.maguire@soton.ac.uk .

**Will my participation be confidential?**
All information that is collected about you during the course of the evaluation will be kept strictly confidential and held within a secure location with restricted access. Your data will be also be given a randomly generated number. There will be an encrypted file stored on a password protected computer that will link your name and address to your identifying number. We need to do this in case you decide you do not want to be part of the study at a later date, in which case we can then remove your data. No one apart from those directly involved in the project will be able to access this information. It might be important to look at the data in years to come, so we will keep it for 10 years and then it will be destroyed. All data use is strictly within the terms of the Data Protection Act (DPA, 1998).

If you disclose a significant risk to yourself or others, then it becomes our duty of care to report this as part of safeguarding adults and vulnerable people. We will discuss this with you first, and support you to report this to your hostel manager and/or your key worker who will then advise you on what action is required, in line with their safeguarding procedures.

**What should I do if I want to take part?**
If you would like to take part, then you will next need to sign the consent form and inform the researchers that you are happy to take part. If you are reading this information outside of a participation session, then you can let staff at the hostel know you are interested and then can pass on your details to the researchers.

**What happens if I change my mind?**
You have the right to withdraw yourself from the study as well as your data. Your legal rights, and routine care will not be affected by you making this decision.

**What will happen to the results of the research?**
This research will be written up as an academic research paper and submitted for publication in a peer reviewed journal. It will also be submitted as part of the researcher's doctoral thesis. If you would like to receive a copy of the results please let the researchers know. The anonymised results will be provided to hostel staff as well.
The data for the project will be stored for 10 years in line with Southampton University Policy.

**Where can I get more information?**
If you would like more information about the study, or wish to obtain a report on your individual data set, then please contact xxxxxxxxxxx
Email: xxxxxxxxx

**What happens if something goes wrong?**
If you have questions about your rights as a participant in this research, or if you feel that you have been placed at risk, you may contact the Chair of the Ethics Committee, Psychology, University of Southampton, Southampton, SO171BJ. Phone: +44 (02380593856), email fshs-rso@soton.ac.uk or the Research Integrity and Governance Manager (023 8059 5058, rgoinfo@soton.ac.uk).

**The University has insurance in place to cover its legal liabilities in respect of this study. Thank you.**

# Appendix B8 – Ethical Approval from Southampton University's Ethics and Research Governance Committee

32204 - The impact of early childhood experiences on people experiencing homelessness. (Amendment 3)

Submission Overview | Submission Questionnaire | Attachments | History

Details

**Status** Approved
**Category** Category A

The end date for this study is currently 21 September 2018
To apply for an extension please click here
*If you are making any other changes to your study please create an amendment using the button below.*

Amendment History

**Latest Version 32204** (Created 19/03/2018)
Amendment 30916 (Created 30/10/2017)
Amendment 30660 (Created 12/10/2017)
Original Submission 26424 (Created 07/04/2017)

User Uploaded Documents

| | Title | Document Type | Original File name | Uploaded | Size |
|---|---|---|---|---|---|
| Current Version | | | | | |
| 1. | Ethics Form | | 18-03-20_054907__32204_180319_063636__30660_171012_101003__26424_170609_110420_ethicsformv13.docx | 20/03/2018 17:49:07 | 40 Kb |
| 2. | Risk Assessment Form | Risk Assessment | 18-03-19_065438__30660_171012_101617__26424_170609_110436_riskassessmentformforassessingethicalandresearchrisksv12.docx | 19/03/2018 18:54:38 | 175 Kb |
| 3. | control recruitment poster | Study Advert/Poster | control recruitment poster v.1.3 .docx | 27/03/2018 17:46:05 | 37 Kb |
| 4. | Control participant information sheet | Participant Information Sheet | participantinformationformcontrolv13.docx | 27/03/2018 17:45:39 | 40 Kb |

Checklist

- Submission Questionnaire ✔
- Ethics/IRAS Form ✔
- Risk Assessment ✔

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# Appendix B9 – Correlational Relationships Between all Subscales.

| | ECR-R Anxious | ECR-R Avoidant | ADA | Total BIS | BIS - Attentional | BIS - Motor | BIS – Non-planning |
|---|---|---|---|---|---|---|---|
| Total ACE[a] | - | - | - | - | -.04 | .01 | -.05 |
| ACE – Emotional Abuse[b] | .20 | .22* | .23* | -.08 | -.13 | .01 | -.07 |
| ACE - Physical Abuse[b] | .22* | .22* | .26* | .02 | -.05 | .09 | -.01 |
| ACE - Sexual Abuse[b] | .06 | .07 | .35** | -.02 | .03 | -.12 | .05 |
| ACE – Emotional Neglect[a] | .29** | .24* | .29** | -.09 | .01 | -.08 | -.13 |
| ACE - Physical Neglect[b] | .31** | .28 | .36** | -.04 | -.03 | .02 | -.09 |
| ACE - Parental separation/Divorce[b] | -.12 | -.13 | .24 | .04 | .02 | -.02 | .10 |
| ACE-Domestic Violence towards Mother[b] | .21 | -.04 | .19 | -.04 | -.01 | -.05 | -.03 |
| ACE -Household Member with Substance Abuse Problems[b] | .07 | .16 | .29** | .14 | .09 | .19 | .03 |
| ACE - Household Member with Mental Health Problems[a] | .18 | .01 | .05 | -.07 | -.01 | -.11 | -.03 |
| ACE - Household Member Imprisoned[b] | .05 | .17 | .18 | -.07 | -.08 | -.06 | -.02 |
| ECR-R - Anxious | - | - | - | - | .13 | .08 | -.14 |
| ECR-R - Attachment | - | - | - | - | -.20 | -.16 | -.25* |
| ADA | - | - | - | - | .12 | .18 | -.02 |

*Note:* ACE = Adverse Childhood Experiences Questionnaire, ECR-R = Experiences in Close Relationships – Revised, ADA = Adult Disorganised Attachment Scale, BIS = Barratt Impulsiveness Scale. [a] = Partial correlation controlling for gender. [b] = Point-biserial correlations involving the binary ACE outcome variables. *$p$ <.05, **$p$ < .01.

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